MARCH, 1955

American Engineer

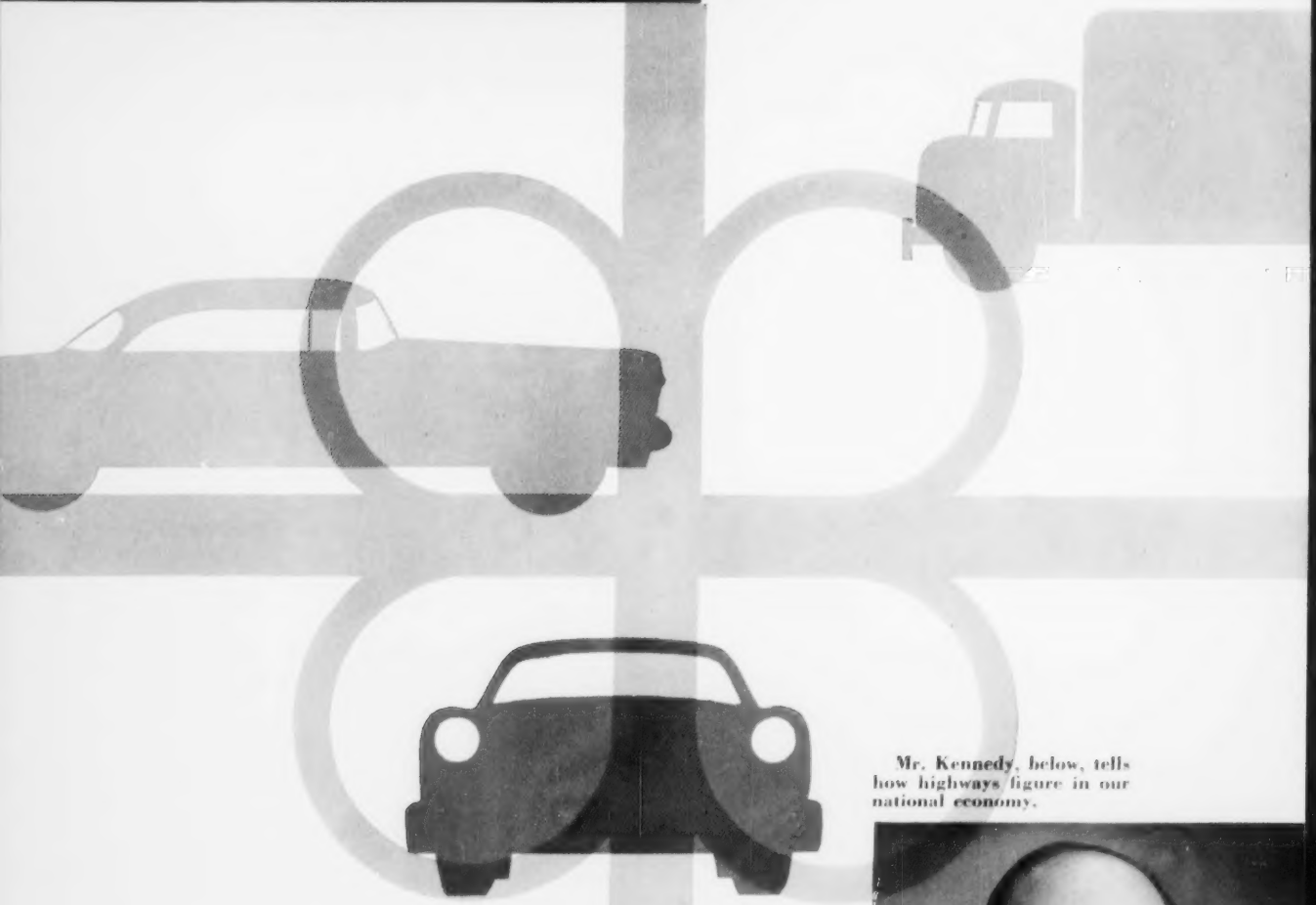
IN THIS ISSUE . . .

- **$50,000,000,000 Challenge to the Engineering Profession**

By

G. DONALD KENNEDY, P.E.,

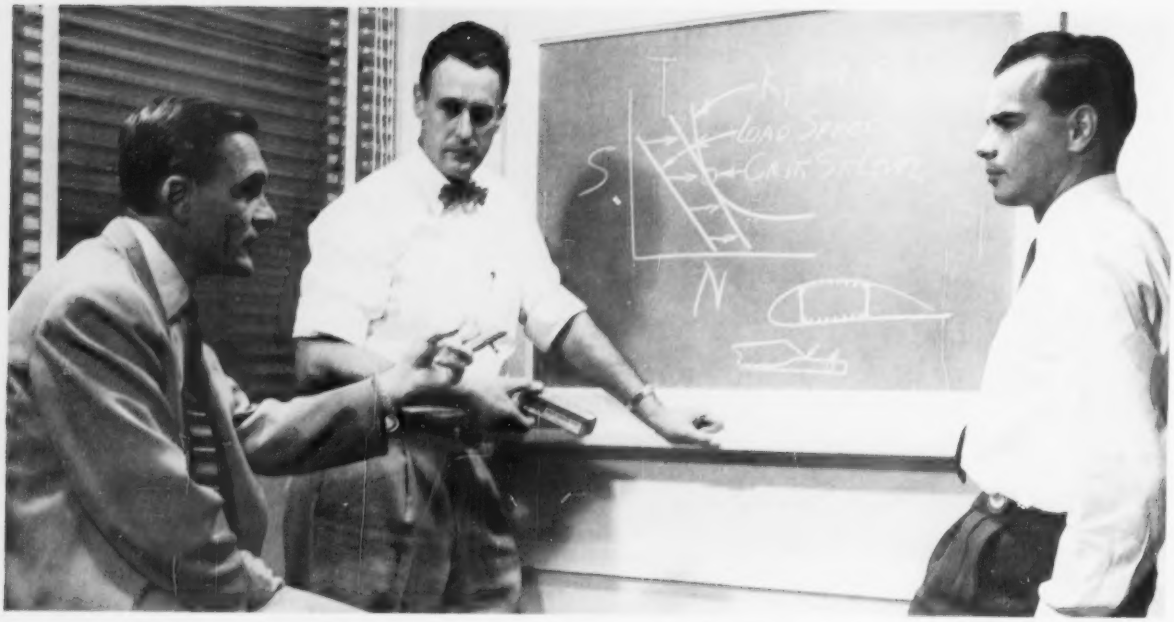
President, Portland Cement Association



Mr. Kennedy, below, tells how highways figure in our national economy.

Also These Added Features . . .

- Engineering and Show Business
- New Engineer-in-Industry Book
- Report of Recent Board Meeting
- Late News from Capitol Hill



J. F. McBrearty, chief structures engineer (left), discusses fatigue test program of integrally-stiffened wing lower surface structure of Super Constellation Model with E. H. Spaulding, structures division engineer and J. G. Leewolt, stress engineer. Lockheed's 500,000 lb. Force Fatigue Machine was used in test program.

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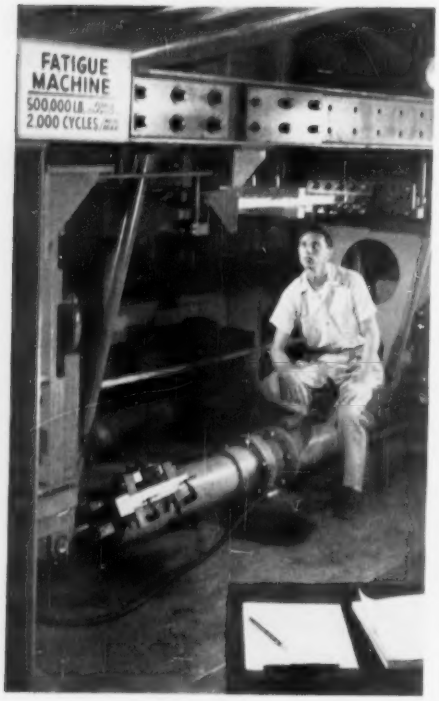

Ralph Oliva, research engineer, examines Super Constellation skin for signs of fatigue failure.

Why Lockheed needs Engineers with Structures training:

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American Engineer

MARCH

1955

American Engineer
20th YEAR OF PUBLICATION
1935 – 1955

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•

If men have free access to knowledge, if they have free use of that knowledge, and if they are taught those ethical and moral principles which will develop proper responsibilities in their exercise of it, we have little to fear in the long run.

—DR. GRAYSON KIRK, *President, Columbia University.*

•

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R. A. Oliver, Advertising Director
American Engineer, 1121 Fifteenth Street, N.W., Washington 5, D. C.
Telephone: ADams 4-1622

NEW YORK:
Austin LeStrange Co., Inc.
420 Lexington Avenue
New York 17, N. Y.
Telephone: MUrray Hill 5-3277

CHICAGO:
LeStrange Co., Inc.
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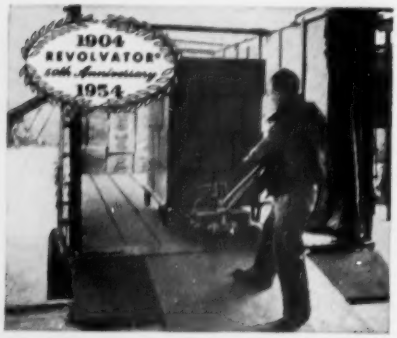
The American Engineer is published monthly by the National Society of Professional Engineers, 1121 15th St., N. W., Washington 5, D. C. Entered as Second Class Matter at the Post Office, Washington, D. C., under act of March 3, 1879. **Copyright, 1955, by the National Society of Professional Engineers. Not responsible for opinions expressed in signed articles.** **Subscription Rates: $2 per year in advance to members of NSPE and its Affiliated Societies; $3 per year in advance to non-members in U. S. A. and its possessions, Canada, and Mexico. Foreign, $4 per year. Single copy, 35c. Vol. 25, No. 3.**



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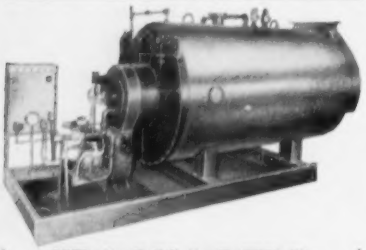

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Letters to the Editor

P.E.'s As Strikebreakers . . .

Dear Editor:

All professional persons should be interested in the following copy of a letter which was sent out to a group of employees of a large . . . firm, including many professional engineers. The group included those "impressed" into strike service during a strike last year. Here is the letter:

> Last summer you and a number of other supervisory, professional, and confidential employees were called upon to assist in operating the Company's power plants during a strike emergency. Your cooperation enabled the Company to continue operations without curtailment of service to customers.
>
> Starting on Monday, February 14, a series of training assignments in the plants have been scheduled to help familiarize you with the work you will be called upon to perform in the event of a similar type emergency in the future. The attached schedule shows your emergency work assignment, the station to which you are assigned, the dates on which training is scheduled, and the training hours.
>
> It is requested that you arrange to report to the Station Superintendent for training on the dates indicated. It is assumed that you will leave . . . at approximately 8 a. m. and will arrive at the stations as soon thereafter as possible.
>
> Please inform me or your department head if you are not able to arrange for private transportation to and from the plants.

To me, as a Professional Engineer (Member of NSPE and Missouri SPE) this represents not only an all-time low in employee relations but also in professional ethics! It places the Professional Engineer between the millstones of union labor and management, and represents an open attempt to train professional, non-operating, non-union men as scabs and strikebreakers. (I do not object to such service in cases of flood, hurricane, etc.) The letter, issued from the Personnel Department of the firm has aroused considerable opposition from the less timid engineers. An engineers' association, consisting of both management and non-management engineers, exists but is largely sterile so far as professional matters are concerned. The engineers are in the so-called "confidential employees" classification, but I believe they were not consulted before the letter was sent out.

I believe that the NSPE ought to interest itself in such tactics which in the end will serve only to drive engineers, especially the younger ones, to those organizations which seek to bring professional men into the unions. I appreciate that many of those in influence within NSPE and MSPE are connected with management, but if they permit their business interests to overshadow their professional interests, then the profession is doomed.

You may publish this letter, but you realize why I should like to be identified under the name

One Who Objects to Being a . . .
Strikebreaker,
Kansas City, Mo.

Military Deferments . . .

Dear Editor:

The information contained in "From Washington" in the January issue regarding the new selective service rules tightening up deferments for graduate students leads me to believe that the problem still does not seem to be well visualized. The reason given by selective service for the new ruling leads me to say that the only thing that has happened has been the elimination of a certain portion of capable young people who are as good as those who would be deferred.

As long as we do not change procedures for deferment we do not gain anything. I just had a letter from a draft board stating that advanced study was of no value. They did not state it exactly in those words but stated that an undergraduate degree was sufficient. As long as we have to follow present procedures in appeals there does not seem to be any gain from the directive—actually there is some loss.

I had understood from some statements made at the Land-Grant College Association Meeting in Washington that the way was open so that those students who meet the President's qualifications, if they were not deferred by the local draft board, could appeal directly to a national board which would without question defer them when they met the qualifications set up in the directive. Apparently I misunderstood the situation. Unless something of the kind that I have mentioned is done, we continually lose without gain.

I think the people are being deluded in connection with universal military training and the two-year training program coming under selective service. I believe it develops a kind of Maginot line type of thinking in which the people may feel that we are gaining security when that is not necessarily the case. A type of program necessary for real security does not involve putting in two continuous years of training in service, but it does involve a type of intermittent program which will keep men up to date in their respective defense fields. The kind of thinking going on seems to be similar to that which goes on in universities in which we run into an educational problem and we try to solve it by adding a course when the course frequently does not solve anything at all.

If our present procedures continue, I do not quite see where any UMT setup so far proposed may solve the problem. I think that unless the Russians change their objective and manner of doing things, that they are going to win by default.

R. L. Sweigert, P. E.,
Dean, Graduate Division,
Georgia Institute of Technology,
Atlanta, Ga.

Corporation Practice . . .

Dear Editor:

High professional standing will be most easily obtained by insistence on personal responsibility for high ethical standards by anybody signing an economic-engineering report. Personal responsibility cannot be enforced where Tom, Dick, and Harry hide behind the anonymity of an engineering corporation. The individual can be haled before his engineering society for violation of its code of ethics; an engineering corporation can be so haled only with difficulty. The recent action of the A. S. C. E. in penalizing some of its members for violation of its code of ethics gives hope that high professional standards will be increasingly demanded of the individual engineer.

One danger of the large engineering corporation is that in its need for volume business, its "business getters" will influence its professional work. Consider the case of

an economic-engineering report on Corporation "A" whose largest stockholder is president of Corporation "B." Suppose the report if it is to be honest with the public has to be unqualifiedly adverse to the selfish interest of the largest stockholder in "A." The executive officers and "business getters" in the engineering corporation will be loath to have the report as frank as would be desirable for fear of antagonizing that stockholder. They will have their eyes on the large volume of business from him as president of Corporation "B." He is naive who believes that the vice president of the engineering corporation in charge of engineering (who under the Carlino-Milmoe Bill in New York State would have to be a professional engineer) will not be under strong pressure to slant his opinions. His ability to hold his job will depend on his meeting the demands of his superiors even if they are not engineers.

The supposition outlined above is pertinent as may be seen from a non-confidential job taken recently by an engineering corporation. Former clients learned of the new job and for selfish reasons telephoned their objections. The engineering corporation feared the loss of future business and withdrew from the job.

Note that a client in good faith had hired an engineering corporation but finally had to depend on another organization with possible loss of time, money, and other advantages. Such action by the engineering corporation lowered the professional standing of all engineers who are supposed to be uninfluenced by any outside interest when working for a client.

Generally a partnership of professional engineers because of individual responsibility will have higher professional standards than the executives of an engineering corporation where individual responsibility is hidden.

GREGORY M. DEXTER, P. E.,
Scarsdale, N. Y.

No Name Change? . . .

Dear Editor:

Recent letters to the editor indicate that considerable thought is being given to the problem of indiscriminate use of the word engineer for such occupations as railroad locomotive operators, heating plant operators, etc. One school of thought seems to be looking for other words to apply exclusively to the engineering profession.

Mr. W. J. Roa, Jr., P.E., deserves credit for ingenuity in coining the word "progineer" (AMERICAN ENGINEER, December, 1954). However, I am not sympathetic with any proposals to use coined words, because they would tend to detract from the dignity of the profession, which I am sure is exactly the opposite of the intended result.

I would be more receptive to the use of the word "ingenieur," which was proposed by Mr. Henry Eckhardt, P.E. (AMERICAN ENGINEER, February, 1955). As he points out, this word has precise meaning and is in wide use elsewhere.

However, and this is the main point of my letter, all efforts to find substitute names for our profession strike me as tactics of withdrawal and retreat. It is hard to conceive of any profession, including ours, giving up its name because of encroachments by others. Let us keep the title engineer, use it discriminately and continue to educate the public as to its proper meaning and use. Only as our profession gains recognition and dignity will we be able to solve the problem of misuse of the title "engineer."

A. G. KEGEL, P.E.,
Baltimore, Md.

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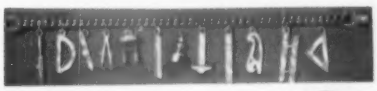

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PROFESSIONAL NEWS IN CAPSULE FORM

A Roundup of Late Events for Professional Engineers

Edwards Gets Seaway Job

Frank W. Edwards, a well-known hydraulic engineer and a former president of the Chicago Chapter of the Illinois SPE, has been named as one of the members of a board of engineering consultants established by the St. Lawrence Seaway Development Corporation to assist in the development of the project. Mr. Edwards, a member of the staff of Stanley Engineering Co., Muscatine, Iowa, is a former head of the Department of Civil Engineering of the Illinois Institute of Technology. At one time he also served as chief of the Hydraulic Section for the design of the Third Locks of the Panama Canal.

Other engineers appointed to the consulting board with Mr. Edwards are: Clarence E. Blee, chief engineer of TVA; Edward M. Fucik, construction engineer, soils expert, and vice president of Harza Engineering Co., Chicago; and Charles M. Wellons, consulting engineer of Pittsburgh, Pennsylvania.

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Hooven Nominated by AIEE

M. D. Hooven, a nationally recognized leader in the power field and a prominent member of the New Jersey Society of Professional Engineers and NSPE, has been nominated for the 1955-56 presidency of the American Institute of Electrical Engineers. Mr. Hooven, who is an electrical engineer with the Public Service Electric and Gas Company of Newark, New Jersey, also has a distinguished reputation for his efforts in the professional area as well as in the technological field.

Another NSPE member—Cullen T. Pearce of Philadelphia, who is with the Westinghouse Electric Corporation—is among the vice presidential nominees of the Institute. Others nominated as vice presidents are: William J. Miller, University of Alabama; Evan R. Jones, Mountain States Telephone and Telegraph Co., Denver; Bradley Cozzens, Water and Power Department, City of Los Angeles; and Bristow G. Ballard, National Research Council of Canada, Ottawa.

Walter J. Barrett was renominated for another term as treasurer, and Julian D. Tebo, John C. Woods, and Paul G. Wallace were nominated as directors. Mr. Wallace, with the Texas Power & Light Company of Dallas, is also a member of NSPE and the Texas SPE.

Balloting for the new officers will be by mail, and results will be announced at the summer general meeting of the AIEE at Swampscott, Massachusetts, in June.

Steinman Foundation Set Up

Dr. David B. Steinman, well-known bridge engineer and NSPE's first president, and his family have announced the establishment of the David B. Steinman Foundation, Inc. The principal objective of the Foundation will be to make gifts to engineering schools for scholarships, awards, and loans to aid deserving students in completing their engineering studies or in pursuing full-time graduate work in engineering.

Spilhaus in UNESCO Post

Dr. Athelstan F. Spilhaus, dean of the Institute of Technology at the University of Minnesota and U. S. delegate to the recent Eighth General Conference of UNESCO (United Nations Educational, Scientific and Cultural Organization) at Montevideo, has been elected to serve on the executive board of UNESCO through 1956. Dr. Spilhaus is a prominent member of the Minnesota SPE and NSPE.

Groves Sounds Alarm

Lieutenant General Leslie R. Groves, vice president of Remington Rand, Inc., and wartime chief of the Manhattan atomic bomb program, recently sounded a warning against the lag in the training of engineers and scientists in the United States. He called attention to the fact that this country is turning out an average of only 20,000 graduate engineers per year with no increase in the rate foreseen, while Russia is now graduating 54,000 and, furthermore, is constantly increasing the annual rate. General Groves also scored the many "snap" courses in the U. S. educational system and the emphasis on awarding more and more degrees which do not always signify real intellectual attainment.

General Groves' remarks were made

"This is the room where Jim spends his evenings puttering around."

during the Military-Industrial Conference, February 10-11, at the Conrad Hilton Hotel in Chicago. The meeting, in which a number of prominent NSPE members also took part, was sponsored by the Society of American Military Engineers in cooperation with industry groups, Government bureaus and departments, and various technical and professional societies.

A view in opposition to proposals made during the conference for more liberal draft deferments and exemptions for engineering students and trained technicians was expressed by Major General Lewis B. Hershey, director of Selective Service. General Hershey expressed the belief that "equality of sacrifice" in the draft was still "a pretty good rule for Americans," and he stated that in a national emergency young men between 18½ and 26 must expect to serve in the armed services and should, therefore, be well trained to do just that.

❁

More Women Needed in Engineering

A shortage of technically-trained American women has been cited by Dr. John T. Rettaliata, president of the Illinois Institute of Technology, as one of the reasons why the United States is losing its scientific manpower advantage to the Soviet Union. Dr. Rettaliata pointed out that the education of women in engineering has been progressing at a "snail's pace" when compared with Russia where an estimated 25 per cent of the engineers are women. In contrast, in this country less than one per cent of the approximately 500,000 engineers are women, he said.

Commenting on women's opportunities in technical occupations, Dr. Rettaliata said: "The scope and variety of work offered in engineering is almost limitless. There is an engineering position suited to almost every temperament, talent, and taste."

Dr. Rettaliata repeated these comments as part of his address before the Military-Industrial Conference on technical manpower, which was held recently in Chicago. (See preceding story.)

❁

Williams Heads National Constructors

T. C. Williams of Wellesley Hills, Massachusetts, executive vice president of Stone & Webster Engineering Corporation of Boston, has recently been elected president of the National Constructors Association. Mr. Williams, who is a leading member of the Massachusetts Society of Professional Engineers and NSPE, succeeds John F. O'Connell, vice president of The Bechtel Corporation of San Francisco, in the office.

Another NSPE member—C. D. Haxby, vice president of The Rust Engineering Company, Pittsburgh, who is also active in the Pennsylvania SPE—was elected vice president of the Association, which is an organization composed of leading engineers and builders of chemical plants, petroleum refineries, steel mills, and power plants.

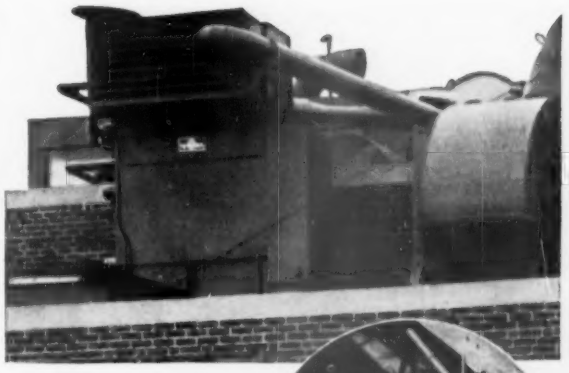
C. B. Bronson was re-elected secretary-treasurer.

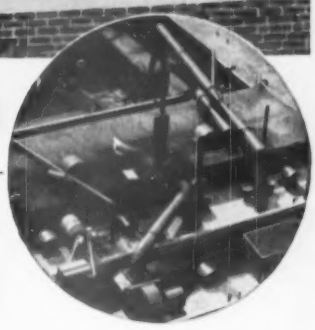
❁

U. S. Engineer to Direct Atom Parley

Professor Walter G. Whitman of the Massachusetts Institute of Technology has been named secretary gen-

(Continued on page 8)





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Briefs

(*Continued from page 7*)

eral for the first Atoms-for-Peace Conference which will be held in Geneva on August 8 under the sponsorship of the United Nations. The appointment, which was made by Dag Hammarskjold, UN secretary general, will make Professor Whitman the top officer of the UN staff handling preparations for the parley.

Professor Whitman has been head of M.I.T.'s Chemical Engineering Department since 1934, and he once directed secret United States experiments on the use of nuclear power for aircraft.

Dr. Homi J. Bhabha, a leading Indian nuclear physicist, has been selected to serve as president of the conference. Plans for the meeting have grown out of the original atoms-for-peace proposal laid before the United Nations some thirteen months ago by President Eisenhower.

Hindeman Elected Ohio Board Chairman

Thompson F. Hindeman of Lakewood, Ohio, a past president of the Cleveland Society of Professional Engineers, has been elected chairman of the Ohio State Board of Registration for Professional Engineers and Surveyors. Mr. Hindeman, who is Cleveland district manager of the Pittsburgh Testing Laboratories, was first appointed to the State Board by Governor Frank J. Lausche in 1951. His term as president will run through 1955.

A graduate of Valparaiso University, Valparaiso, Indiana, Mr. Hindeman, in addition to being active in NSPE and the OSPE, is a member of the American Chemical Society, the American Society for Testing Materials, and the Cooperative Committee of Architects, Engineers and Contractors.

Argraves Is Named Highway Commissioner

N. E. Argraves of New Haven, Connecticut, a prominent member of the Connecticut SPE and NSPE, has been named by Governor Ribicoff to the post of Highway Commissioner. In this capacity he will be in charge of the design and construction of the multi-million dollar thruway to be built across the State from New York to Rhode Island.

Mr. Argraves, a structural engineer, is registered in California, New York, and Pennsylvania, as well as in Connecticut. Most recently he has been serving as chairman of the Connecticut Registration Board.

W. H. Wheeler Is Honored

Walter H. Wheeler, prominent Minneapolis consulting bridge and building engineer, has been selected by the Engineers' Club of Minneapolis as its Roster Engineer for 1954-55. An active member of the Minnesota SPE, Mr. Wheeler is the inventor and owner of the "Smooth Ceilings" system of flat slab construction used in several hundred buildings throughout North and Central America. He was also responsible for the design and construction of the Fort Snelling-Mendota Bridge, the largest multiple rib arch reinforced concrete bridge in the world.

Kern Elected to Heating Engineers' Council

Raymond T. Kern, chief engineer of the Jennison Company of Fitchburg, Massachusetts, and a member of the MSPE, was one of five engineers elected recently to serve three-year terms on the Council of the American Society of Heating and Air-Conditioning Engineers. Others elected to the Council were: Bert W. Farnes, Portland, Oregon; Cary B. Gamble, New Orleans, Louisiana; Walter A. Grant, Syracuse, New York; and D. M. Mills, Houston, Texas.

John E. Haines, vice president of the Minneapolis-Honeywell Regulator Company, is the newly-elected president of the Society. Other new officers are: John W. James, Chicago, Illinois—vice president; Peter B. Gordon, New York, N. Y.—second vice president; and Elmer R. Queer, State College, Pennsylvania—treasurer.

American Engineer

The Magazine of the Registered Professional Engineer

VOLUME TWENTY-FIVE, NUMBER THREE

$50,000,000,000 CHALLENGE
to the Engineering Profession

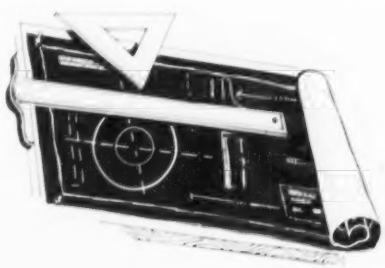
By
G. DONALD KENNEDY, P.E., PRESIDENT
Portland Cement Association

OUR nation is on the threshold of the greatest highway construction era in its history.

President Eisenhower's proposed $50 billion highway program and the increased appropriations of the Federal Aid Highway Act of 1954 have set the stage for a record decade of street and highway construction. The mileage of toll roads now under construction or soon to be built is nearly 4½ times the total turnpike mileage constructed in the automotive history of the United States. With this promise of a new surge in roadbuilding comes a new and widening challenge to American engineers.

In the next ten years, expenditures for new roads and streets might exceed $100 billion. This is twice the amount spent for this purpose in the 38-year period 1916-1954, and would be accomplished by planned increased expenditures not only at the Federal but also at state and local levels.

The President's program is not the entire structure, but the keystone of a ten-year roadbuilding program that would more than double the record annual outlay of $3.7 billion spent on construction in 1954.



The $50 billion of the President's plan represents the approximate deficit between an estimate of the total construction needs for the nation's streets and highways through 1964—$101,365 million—and the funds estimated to be available for road construction during the same period—$46,800 million. Included in these monies to be available in the coming decade are funds authorized by the Federal Aid Highway Act of 1954, which increased annual authorizations to the states by 52 per cent over the 1952 Act (to $875 million). The President's plan, if approved by Congress, will mean an outlay by the Federal Government of roughly $25 billion *above* present expenditures, with the new money to be raised through Federal bond issues not charged to the regular treasury debt. In reporting their study on highway needs, the President's Advisory Committee on a National Highway Program headed by Gen. Lucius D. Clay said the committee "hopes and believes that all Government units will participate and cooperate in this program . . ." This would be necessary for the remaining $25 billion of the President's plan.

As presently set up, the program would place major responsibility for completing and financing the National System of Interstate Highways upon the Federal Government. Under the Federal Aid Act of 1954, for the first time, the states pay about 40 per cent of the cost of the Interstate System rather than 50 per cent as in past years. With the Federal Government assuming increasing responsibility for the Interstate System, corresponding amounts of state funds will be released for other roads. In this way it is hoped the entire network of Federal aid highways and all other of the nation's roads will benefit from the plan.

The impact of the expanded highway program will extend much further than the construction field. It will naturally be a boon economically in the sense that it will create and increase employment and demand for goods and services. But it will be far more than that. It has become a "must" for the continued growth and prosperity of the nation. As the number of cars and trucks and the amount of travel have increased, the importance of the nation's highway network has increased proportionately as a factor in the national economy.

Peace or War, the U.S. Needs Roads and Now!

The heavy volume and higher speeds of present-day traffic, and the even heavier traffic predicted for the future, call for the design and construction of many more highway grade separation structures. This four-level concrete grade separation on the Hollywood Freeway in California is called the "Mix-Master." Traffic from four thoroughfares cross here without intersecting and without reduction of traveling speed.

In the short span of years since the beginning of World War II, the nation's traffic volume has increased *by more than two-thirds*, to some 58 million vehicles traveling an estimated 557 billion vehicle miles yearly. By 1965, it is predicted that 81 million vehicles will be traveling 814 billion vehicle miles.

This increase in traffic has not been equalled by highway construction. Roadbuilding, which slackened greatly in the late thirties and virtually stopped during World War II, has lagged behind motor vehicle registrations and travel. The gap has widened steadily between traffic requirements and highway capacity until the warnings of engineers and highway officials have in recent years become the warnings of industry and private business as well.

The reasons for concern on the part of industry, agriculture and business are clear.

Today, 77 per cent of freight tonnage moves over roads and streets, with virtually every industrial product utilizing the highway system at some time in its movement to market. In agriculture, 99.7 per cent of shell eggs, 99.8 per cent of live poultry, and almost 80 per cent of the livestock in this nation reach major wholesale markets by truck. The annual loss attributed directly to inadequate highways through loss of time, increased transportation costs, higher operating costs for personal automobiles, accidents, property damage and loss of life has been placed at more than $3 billion. The Automobile Manufacturers Association in 1953 presented statistics which showed how an adequate interstate highway system would save motorists $2.1 billion each year. One out of every seven persons employed in the United States is employed in highway transport industries.

Thus, in terms of dollars saved as well as dollars spent, in terms of lives as well as in terms of livelihood, the impact of this proposed roadbuilding program will be far-reaching and significant.

THE President's plan reflects the thinking of bankers as well as engineers, highway users as well as highway builders.

This is mirrored in the make-up of the President's Advisory Committee, which included in addition to Gen. Clay as chairman, Stephen D. Bechtel, president of Bechtel Construction Engineering Corporation, San Francisco; Dave Beck, president of the AFL International Brotherhood of Teamsters; S. Sloan Colt, president of Bankers Trust Company, New York; and William A. Roberts, president of Allis-Chalmers Manufacturing Company, Milwaukee. During formation of the program, a large number of engineering and automotive organizations and other interested groups were heard by the committee, representing sometimes widely divergent opinions. The President's proposed program thus should not be construed as strictly an "engineering" proposal and construction task. Methods of financing were perhaps the major consideration of those concerned with its final form.

The fact remains, however, that the ultimate execution of the program will present a very real and strong challenge to engineers and to the construction field. In the final analysis, the success of the program will depend upon how well the President's "Grand Plan" is translated into highway pavement, bridges and structures. Engineers will be called upon for vision and foresight in designing and building roads that will be adequate for the traffic needs not only of today but of 20 and 30 years hence. Indeed, unless our roads today are built to insure the fullest return

from every construction dollar, this program, no matter how large and well-conceived, will be grossly inadequate. It is not far-fetched to say that decisions made in the next few years by public officials and engineers participating in this program will affect the transportation economy and well-being of this country for a quarter-century—perhaps a half-century—to come. The responsibility is immense. The ten-year program outlined by the President is the first real roadbuilding boom since the late twenties and only the second since the arrival of the automobile.

ENGINEERS must face, for example, the problems of rapid obsolescence and deterioration. If roads built today are outmoded by the changing traffic of the next fifteen years or so and require replacement, who must answer for a lack of vision? If roads built today fail to stand up under tomorrow's heavier traffic volumes and weights, who will shoulder the blame—and expense?

The dependence of Americans—housewives, farmers, businessmen, industry—upon an adequate highway system is enormous. The amount of money to be expended in bringing this system up to par is also enormous. The responsibility of the engineer in assuring to the country a safe modern highway system for this money is no less sizable.

The challenge is not merely to build more highways and streets but to build roads of maximum service per dollar invested—to build fewer miles if necessary, but mileage that will stand up to future requirements: to build modern roads that will remain modern for many years to come.

If roads are built now which during or after expiration of the program will require additional large expenditures for relocation, redesign, repair and maintenance, then the country is in for real trouble. Instead of decreasing the disproportionate amount currently being required for patchwork, stopgap maintenance on old roads, the program will actually serve to *increase* this mounting burden. The hope that lies in new road construction can become the despair of future motorist-taxpayers, who will be saddled with the expense of maintaining a system too soon grown old.

In recent years toll roads have gained popularity as one means of obtaining new roads. Of the mileage of toll roads now in operation, some 44 per cent have been opened to traffic within the past twelve months. This trend raises several points worth mention.

First, of course, is the indisputable fact that road users are willing to pay a premium for good roads.

Second, toll roads must be profitable roads, and they must be profitable in competition with adjacent free highways. To succeed, they must be built for good visibility, low grades, long curves, driving ease and safety. They must be designed to superior standards to provide superior service.

Third, a turnpike is an operation built to make a profit within the amortization period of bonds. Any expenditure for maintenance, repair or similar purposes, in effect is an assessment against these profits. For this reason, an unusual amount of attention should be paid to load-carrying capacity in the design of a turnpike.

WHILE toll roads and free expressways differ in certain features, there are many similarities. Both must be designed for superior service. Both must have pavements built for long years of heavy-duty wear at low maintenance costs if they are to be "profitable" roads. Needless to say, a free road also is built with public money, just as is true of toll roads. Like toll roads, they should be "earner" roads.

Of course, not all roads built during the next decade can or should be built to expressway standards. But each road should be designed and built on the basis of safety,

The Houston, Texas, Expressway, shown here from the air, is an example of the multi-lane heavy-duty expressways being built in metropolitan areas to relieve congestion and facilitate rapid movement to and from downtown districts.

New equipment combined with new techniques make possible the construction of better, longer-lasting highways for future years. Here, a concrete construction train paves the first of four lanes on a stretch of the New York Thruway, which now has almost 400 miles open to traffic.

and present and anticipated future traffic volumes and weights . . . that is, it should be built on the basis of a fixed load-carrying capacity and it should be built for lowest cost per year of service.

Over the life-span of a given road, the "profits" resulting from careful, accurate design can pay for many additional miles of roadway.

The modern expressway systems being built in almost every metropolitan area in the nation today attest to the fact that people are willing to pay for first-class design and construction in their "free" thoroughfares, just as they are willing to pay a cent and more per mile for use of toll highways. The engineer has a responsibility to design in accordance with the traffic requirements of every project in which he takes part, large or small. If a road is to carry only light traffic for the foreseeable future, then it stands to reason that the design requirements are those of a light-traffic road. But if a road will probably carry increasingly heavy traffic, then design on the basis of initial cost or indeed on any basis other than load-carrying capacity is in effect unsound.

When designing for the future, engineers exercise considerable foresight. It is interesting to look at some of the concepts of what constitutes modern highway design today, and what may constitute modern design tomorrow.

Here is a quotation which might be used to summarize modern highway design today:

"Modern design tendencies in this country include insistence upon longer sight distances, easier curves, the flattening of all slopes to safer angles, protective devices, planting and other landscaping of the roadsides. This will provide safer and more beautiful highways. There is also insistence on the separation of multiple traffic lanes by a neutral strip between the opposing lanes of traffic, and there must be on these highways a liberal use of grade separations for cross traffic."

This statement was made before a meeting of the American Automobile Association nearly 20 years ago by Thomas H. MacDonald, former Commissioner of the Bureau of Public Roads.

What about structural design? Most engineers today think primarily in terms of soils and subbases, pavement thicknesses, and the effect of given loadings. And they look to results of research and development for the best methods of eliminating damage from the elements. Here is a quotation which might summarize these ideas on structural design:

"We are studying the design of roads from the technical standpoint, endeavoring to develop better methods of construction . . . In order to improve our designs we are going into a study of subsoils and foundations and wearing surfaces, the effect of climate, drainage and loading . . ."

This was delivered 34 years ago in another speech by Chief MacDonald.

It is evident that American engineers have not lacked in vision and foresight in past years. They have known and advocated "modern" design features for almost a third of a century. They did not have the advantage of 1955 developments in the highway field and could not foresee the nation's tremendous automotive expansion, yet they were able to plan with remarkable success.

It is doubtful that even the most farsighted engineer a decade ago could have anticipated the changing character of traffic that has taken place during the last ten years, in which time the number of trucks on our highways has doubled. Past estimates of increases in motor vehicle registrations have also been almost unanimously conservative.

The Clay Committee report submitted to the President contained estimates and projections of population, motor vehicle registrations, travel, income from gasoline and other taxes, expenditures, highway costs and many other data aimed at establishing needs, resources, and road requirements for future years. From an engineering standpoint, these data present excellent reasons for the greatest concern on the part of engineers in designing and building roads adequately suited from every standpoint for the volume, weight, speed, and character of traffic they will be called upon to bear.

In past years the highway problem has been largely an economic one. Funds have simply not been made available for the construction of a truly adequate road system. Depressions and wars have diverted money and attention from the construction of enough *good* roads. Thus, while great strides have been made during these years in both design and construction techniques, it is not surprising that the relative need for modern roads is today eight times greater than in the early twenties. We have been slipping behind not because of, but despite engineering and technological advancements.—***End.***

About the Author . . .

G. Donald Kennedy of Wilmette, Illinois, president of the Portland Cement Association, is registered as a civil engineer in eleven states and the District of Columbia. Immediately prior to joining Portland Cement as a consulting engineer in 1950, he served as vice president of the Automotive Safety Foundation, directing its highway development activities.

During World War II, Mr. Kennedy was vice president of the President's Interregional Highway Committee and also a member of the Highway Traffic Advisory Committee to the War Department. Later he was a member of the Public Works Task Force of the Hoover Commission.

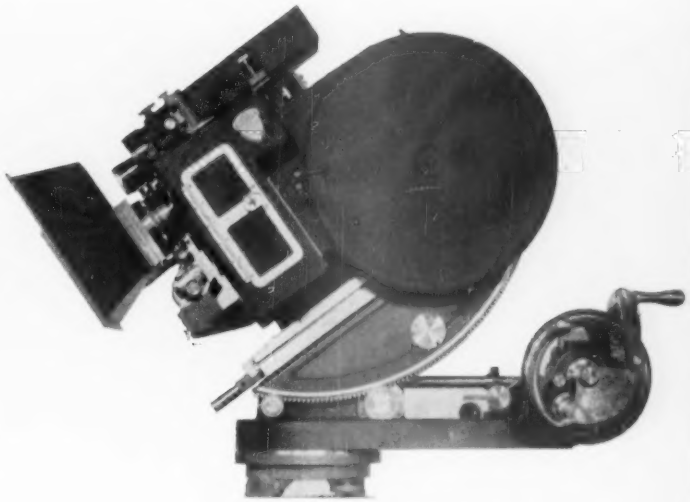
His experience has also included service as Michigan State Highway Commissioner. He has been a president of the American Association of State Highway Officials. In 1948, he received the George S. Bartlett Award for his "Outstanding Contribution to Highway Progress." A graduate of the University of Michigan, Mr. Kennedy also belongs to numerous engineering and other organizations.

Engineering and Show Business

By LOREN L. RYDER, P. E.,

Head, Engineering, Research and Recording, Paramount Studios, Hollywood, California

Show Business Would Go Out of Business If It Were Not for Engineers, Says the Author



New VistaVision camera shown in "Tilt" position on special mounting base. Note 2000 ft. film magazine at side. Film is turned in camera and exposed horizontally providing a negative 2½ times as large as old system. Film is taken up on another magazine at opposite side. This camera was manufactured by the Mitchell Camera Co. from specifications supplied by the Paramount Engineering and Camera Departments.

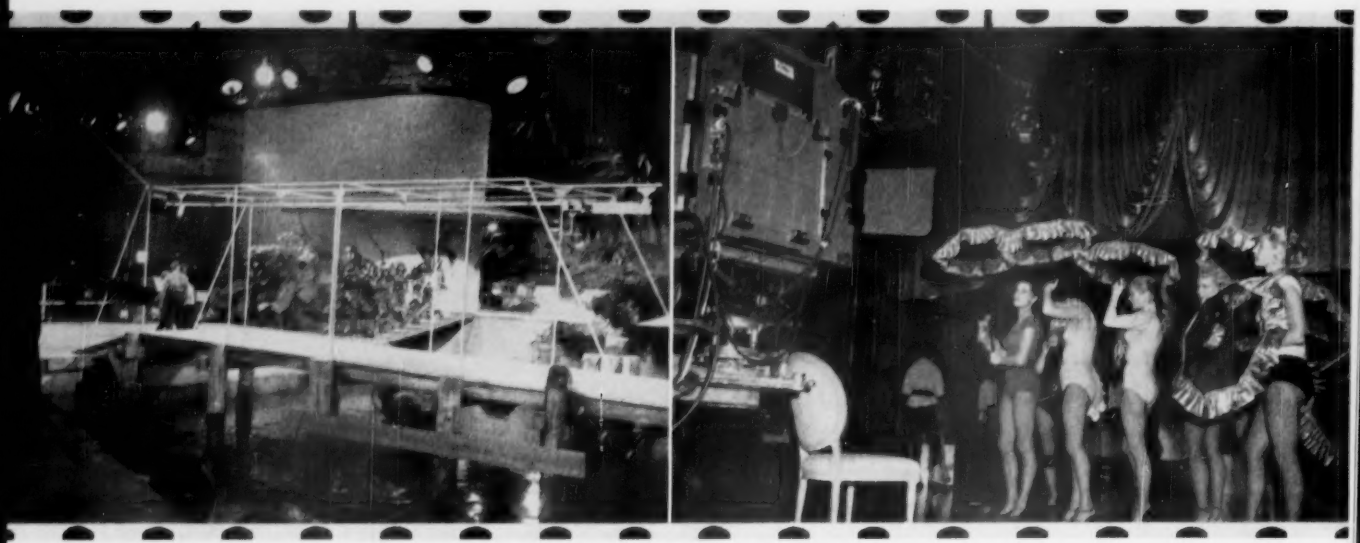
LURKING behind theatre marquees everywhere stands the shadow of a little publicized group known professionally as the engineers. A limited quantity in the entertainment field though a substantial contributor to entertainment whether mechanical, optical, electrical or some other form of the scientific arts, the engineer in some manner or other precedes public exhibition to a point where "Show Business" would be "Out of Business" without him.

If this seems like a hard pressed point, consider the plight of radio, TV and the movies. Did not the engineer conceive and develop the intricate mechanisms needed to bring these innovations to completion? Even the legitimate stage with its lighting and scenery would be bare indeed without there being some form of engineering ahead of the show itself.

No place in the world is the engineer so remote from and yet so important to the end result as in show business. From silent motion pictures, through the era of sound, into radio, TV, 3-D and now the giant screen process, the advancement of entertainment is more and more dependent upon the engineer. I can say this with some degree of authority particularly with respect to motion pictures since the past 26 years of my life have been devoted to exploration through engineering into all phases of motion picture manufacturing and presentation. While "the play is the thing" and acting retains its original form, technical changes continue to introduce new methods to assist the showman. It is here we find an ever increasing gap between the thinking of the creative showman and the engineer.

Many showmen are reluctant to attempt new methods preferring not to take chances with a cast, story and film, yet unless it is done, advancement technically would stand still. I can well remember when the first "Talkies" were introduced. Talking pictures would never be accepted by the public, according to some producers. How could it ever work? It was far too fantastic. Yet from a modest beginning when recording discs were separately synchronized to match the picture, engineers later perfected optical "Sound on Film" and the "Talkies" were here to stay. But there was another set of facts showing the engineer and the showman were apart; for example, the creative showman, particularly the comedy writer, may spontaneously create an idea, gag or story situation which

Full size reproduction of the new engineer-developed VistaVision camera negative showing size and placement of the image.



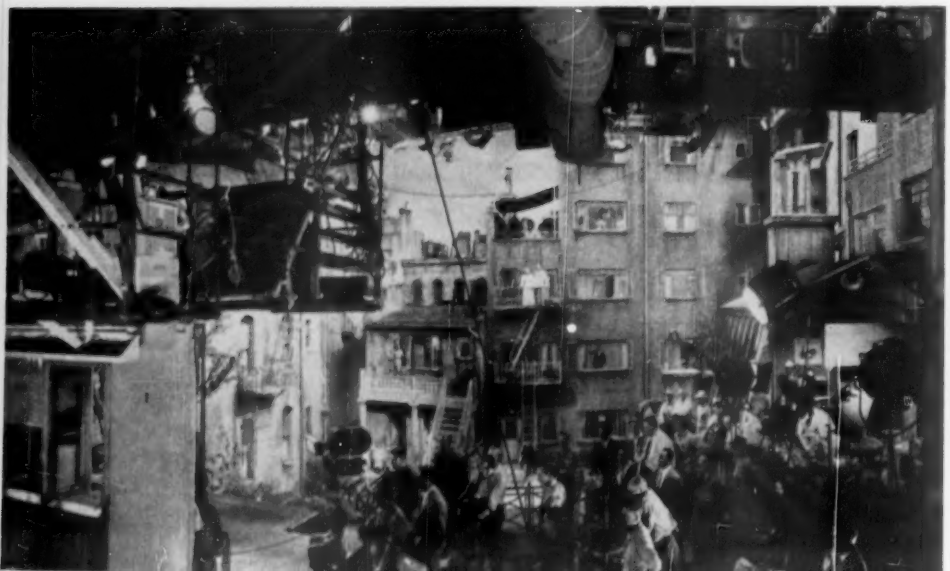
Shown is set used for "While we're dancing" number, left, with Danny Kaye and Vera Ellen in Paramount's "White Christmas." Spot lights for illumination are all out of camera range. At right is an interior scene during rehearsal for Paramount's "Girl Rush" showing such equipment as soundproof camera, floodlight, microphone boom and girls.

is later applied to an entertainment program. The showman then, creates first and later applies whereas, on the other hand, the engineer observes a problem, analyzes the need, thinks out what is required and eventually comes up with the idea.

Take the optical sound track for instance. It was a great step forward from the old wax disc, but engineers observed early what limitations existed and today magnetic recording has practically replaced the optical method for original sound tracks not only for motion picutres but for radio and TV as well.

SELDOM does complacency enter the picture, however, for with the solution of one problem the engineers set about on another. These take such forms as camera design, improvement of projector mechanisms, new optics, film, etc. I would like to point out here that not all of the ideas and conclusions are the result of tight little engineering groups within each studio. Rather, we find such institutions as RCA, Western Electric and DuMont, along with Eastman, DuPont and others, pouring hundreds of thousands, yes, millions of dollars into engineering and basic research opening new avenues for tomorrow's technical adventure.

In this connection we must consider the supervising engineers for the entertainment industry. Large manufacturers are primarily engaged in building equipment and supplies. The need must come from the place of use or consumption. What they build is largely from ideas suggested by the supervising engineer. This is the important link between showmanship and development. The problem then of the engineer is that of co-ordinator, since the showman has little or no understanding of the thinking of the engineer. It therefore becomes his task to analytically appreciate what the showman wants and needs and with this understanding bring together minds that ordinarily work along diverse paths. In this manner, ideas are transmitted to other research organizations for development.



One of the largest sets ever built on a sound stage is shown here taken from Paramount's "Rear Window." Everywhere in this scene, evidence of the engineer is visible, yet, from the public viewpoint, only the story, portrayed by the acting and scenery are important and this is the way it should be. Engineering is really a behind the scenes activity.

Exterior scene from paramount's "Vagabond King," left, showing booster lights and camera equipment on movable dolly for traveling shot. Kathryn Grayson and Oreste Kirkop are in the wagon. Another scene from Paramont's "Vagabond King," right, shows VistaVision camera about to photograph a wagon moving through a wheat field.

To accomplish the foregoing it must be said that a successful supervising engineer must also be a showman. He must think not only in terms of analytical proof of a problem but must also have a keen consideration of human values that perhaps contain some element of guess. The combination of executive skill and engineering knowledge are most necessary assets.

In considering show business the public generally thinks of what we do in terms of reality, whereas, actually we are telling a fiction story and our purpose is to make this fiction believable even though imaginary methods are used to accomplish it. We must follow the point of interest in a story and do what is necessary to convey the proper feeling and illusion. In sound handling, for example, we may play the sound of cattle high and loud for a long shot where we are endeavoring to establish the scope and greatness of a cattle drive but when we cut to the center of the drive to follow the story and love interest, we drop the sound value. This we call reverse sound perspective. In motion pictures we also speed up and retard action to aid in the tempo. These things come within the province of the supervising engineer so that, showmanwise and technically, the result will have the desired effect.

Where the engineer may be prolific in his special field, it is also important that he be adept in the expression of his ideas to the creative showman. This becomes another link in preparing for the adoption of such ideas. Engineers may talk technical formulae among themselves but for the showman they need another language, the language of the theatre. A case in point is Paramount's latest development which employs a horizontal method of photography whereby the original negative is more than twice the size of the old frame. This system, to which we have given the name of VistaVision entailed a good deal of designing, re-designing and testing, all of which was of only passing interest to the creative showman. To him the fact that a bigger, brighter, clearer picture appeared on the screen was significant for, showwise, here was a better medium for expressing the story. To the supervising engineer falls the task of convincing the showman that for a certain number of dollars and given development time, this technical or mechanical device will pay off in added public interest. Actually we are manufacturing entertainment and while the writers, directors and actors get the "Oscars" it still remains that without the engineer there would be no such thing.

If this seems like an attempt to glamorize the technical end, let it be said that throughout the whole process each group leans on the other, for it takes concerted effort of every type of brain and brawn to produce a motion picture from story conception to public exhibition—and the engineer is just one part of the whole.—***End.***

About the Author . . .

Mr. Ryder

Loren L. Ryder is Head of Engineering Research and Recording for Paramount Studios. He holds a B.A. in Research Engineering from the University of California and is a registered professional engineer in the State of California.

He is a member and past president of the Society of Motion Picture and Television Engineers and a member of the Academy of Motion Picture Arts & Sciences from which several academy awards were received. Among them are awards for special recorded sound effects, for pioneering recording on fine grain film and for the first studio wide application of magnetic sound recording for motion pictures.

Mr. Ryder has done extensive work in connection with wide screen film presentation, particularly in the development of the VistaVision process of photography and projection now currently being employed in making all Paramount Pictures. In addition, he is president of Ryder Services, Inc., specializing in magnetic recording for motion pictures and television.

Salaries, Unionism, Professional Status Explored in New Engineer-in-Industry Book

By ROBERT A. BLACKBURN, P. E.
Chairman, NSPE Engineer-in-Industry Committee

"Among the many challenging problems facing the engineering profession none is more fundamental or urgent than the status of engineers employed in industry because this is the status of most of the engineers of the nation."

THE statement quoted above is the first sentence of the introduction of a new publication, "A Professional Look at the Engineer in Industry," prepared by the Engineer-in-Industry Committee (shown below) of the National Society of Professional Engineers. The truth of the above-quoted statement can be seen from the single statistical fact that approximately sixty-five to seventy-five percent of all engineers are employed in industry. The welfare of this important group, in a real sense, reflects the condition of the entire engineering profession. If we do not continue to make substantial progress in meeting the problems and aspirations of this group, we, as a profession, will be failing in one of our major responsibilities.

When the Board of Directors of NSPE authorized the appointment of a special committee to consider the problems and interests of engineers in American industry, a real challenge was presented: find out all you can about engineers in industry; who they are; what are their special problems; what is their economic status compared to others; are they accorded professional recognition and treatment; what are their major areas of dissatisfaction:

(*Continued on page* 18)

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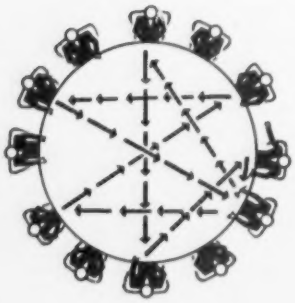

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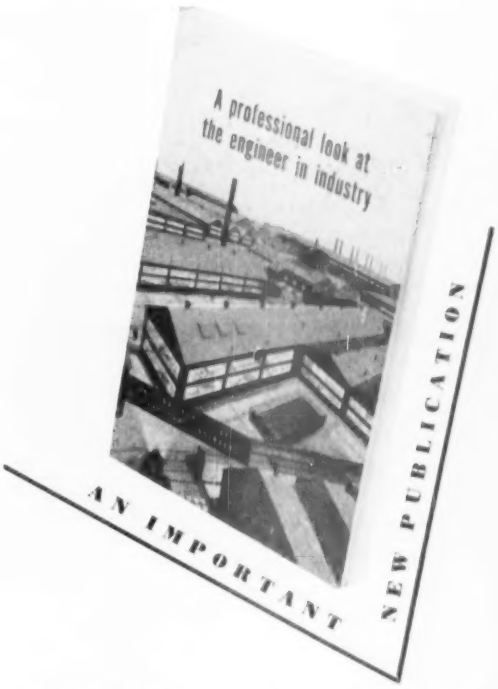
A Professional Look at the Engineer in Industry



HERE, after more than a year of intensive research and study, is a major publication of vital importance to the engineering profession. The Engineer-in-Industry Committee of NSPE has delved into all phases of the professional and economic status of that group which comprises the largest number of engineers in any functional field. This publication is truly unique in that it brings together in easy-to-read form, for the first time, all of the pertinent facts about the background and present situation bearing on the future professional development of engineers employed in all types of industry and the related effects on all other professional engineers.

• 128 pages • 6 illustrative charts • 11 tables of economic data • fully documented by more than 250 references • bibliography and index

A Professional Look At The Engineer In Industry presents a challenging program to bring about improvements in the professional and economic position of engineers in industry.

CHECK THESE CHAPTER HEADINGS

_____ The Impact of the Wagner Act
_____ The Medicine of Taft-Hartley
_____ Taft-Hartley In Action
_____ The Causes of Dissatisfaction
_____ The Influence of Unions
_____ Professionalism Versus Unionism
_____ The Middle Ground
_____ A Program of Action
_____ Facing Up To The Challenge

The readers of this book will find facts, comments and answers to such important problems as:

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- Past and Present Economic Facts.
- The Danger of "Leveling" in Professional Salaries.
- Comparison of Engineer Salaries With Other Professions — With Skilled Labor.
- Improving Engineering-Management Communications and Utilization.
- The Challenge of Engineering Unions.
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Book (*Continued from page 17*)

and, most important of all, what should be done to aid them in improving their position in the profession and in society?

To attempt to meet this challenge the Committee undertook an exhaustive program which was first directed at ascertaining the prevailing facts. Numerous references were consulted and detailed attention was given to any and all sources of information and comment. We were primarily concerned with the thinking of the engineers working in industry and what they thought about their conditions. Conferences were held with representatives

Professional engineers with Standard Oil of California talk it over with field crews. More engineers work in industry than in any other field.

of industrial management to secure their point of view. Many suggestions were offered, often conflicting ideas were presented and intensive debate ensued on where we stand, where we are going and the best route to take.

EARLY in our work it became apparent that a proper understanding of the problems could not be achieved without an appreciation of the historical influences of past years. Much that has gone before has exerted a tremendous influence on the present status of the engineer in industry and much of that history needs to be clearly understood as we look for new methods and improved techniques in the engineer-industry relationship. Therefore, the Committee has devoted some attention to the influence of the Wagner Act on engineers' labor relations and organizations and has reviewed the manner in which the conditions under the Wagner Act led to the adoption of the professional provisions of the Taft-Hartley Act. We have also analyzed the significant changes in engineer-industry relationships under the Taft-Hartley Act and how the provisions of the law have been applied.

Likewise, to fully understand and appreciate the current controversy over the attempts of some to unionize engineers in industry, it is desirable to know the story of when and how engineers' unions entered the picture, how successful they were, what new problems were created by the emergence of engineers' union activity and how the profession and industry reacted to this development.

Also fully explored in the publication are the facts about the development of non-bargaining, or "sounding board," organizations of engineers in industry: how they differ from the unions, their operational problems and the current proposed changes to the Taft-Hartley Act which would, on the one hand "outlaw" the non-bargaining groups, and, on the other hand, confirm their legal status as associations outside the scope of union identification.

A CONSTRUCTIVE study of the conditions of engineers in industry must take into account the important matter of economic status. This the Committee has done and much of the material is devoted to a review of the economic facts. A number of tables and charts have been employed to cover this field and conflicting claims about economic conditions have been explored. The publication covers various minimum salary suggestions, comparisons with other professions and with skilled labor and carefully reviews the "leveling" problem about which there is so much concern.

Having carefully reviewed the pertinent facts about all important aspects of the status of engineers in industry, the Committee turned its attention to the difficult, but highly important, consideration of how to improve the position of engineers in industry. The Committee would be the first to say that it has not found a panacea for all the problems of engineers in industry or for the problems of management in its relations with the engineers. It has developed what it regards as a sound and constructive program, specific in nature, which can, if implemented, show the way toward progress. After its investigations, discussions and debates, the Committee concluded that the right approach to such progress is through a joint and cooperative program involving the engineers in industry, an enlightened management and the professional societies. It is our firm conviction that only through this method can we advance the interests of the engineering profession and retain and improve our professional status.

The suggested program, which we have termed "A Program of Action," is divided into areas of professional status, professional employment conditions and economic conditions. Each division suggests a number of steps which can and should be taken, the sum total of which, if faithfully implemented by the elements involved, can lead to the dawning of a new and brighter day for engineers in industry and for American industry.

THE Committee urges every professional engineer who is interested in the future of his profession to take a look at "A Professional Look at the Engineer in Industry." We urge the members of industrial management to do likewise. We ask that you read the book carefully and critically, if you will, and weigh the ideas we have presented. If you will do this much, and then participate in your company, among your fellow professional engineers, and through your local engineering organizations in developing a cooperative program of improving the status of engineers in industry, the Committee will feel rewarded for its efforts.

It should be noted that the publication of "A Professional Look at the Engineer in Industry," is not an ending, but a beginning. The Committee now looks forward to another challenging and inspiring job of pushing forward the work started to the end that we shall all do our part in building a greater engineering profession, a more productive system of industrial enterprise and, thereby, a better nation.—***End.***

Ready to go to work is the NSPE Board of Directors at the Charlotte, N. C., meeting. At the table in the left foreground President Clarence T. Shoch, second from left, is joined by, left to right, V. P. Frank W. Wooten, Jr., Executive Director Paul H. Robbins, and V. P. Robert J. Rhinehart.

Variety of Professional Topics Considered by NSPE Board at Spring Meeting

"ALMOST successful meeting" is the report received from Charlotte, N. C., where the NSPE Spring Meeting was held, February 18-19, in conjunction with the Annual Winter Meeting of the Professional Engineers of North Carolina. Preceded by a day-long NSPE Executive Committee session on the 17th, the conference featured professional and social sessions plus a special program for the ladies.

An address of welcome to the delegates was given by the Hon. James S. Smith, Mayor Pro-Tempore of the City of Charlotte, as the meeting got under way at the Hotel Charlotte, called to order by NSPE President Clarence T. Shoch.

The principal address at the Annual Banquet was delivered by Hal Hale, assistant to the vice president of the Association of American Railroads, who stressed the transportation industry's dependence on the skill of the engineer. Another major address was made at the Saturday luncheon by the Hon. Capus M. Waynick of High Point, N. C., former U. S. Ambassador to Nicaragua and Colombia. Mr. Waynick discussed the problem of the engineering manpower race with Russia.

The program of regional luncheons with the various NSPE vice presidents presiding was also repeated to give the delegates a chance to share information of particular interest in their areas. (See next page for photo).

The installation of PENC officers for 1955 was another highlight of the conference as outgoing President Earle C. Hubbard turned his gavel over to B. O. Vannort. Other new PENC officers are: Dr. Walter J. Seeley and Norman T. Budine, vice president; Ralph E. Fadum and David Tobin, governors; Robert B. Cochran, Jr., secretary; and William P. Wells, treasurer.

John Bolen served as general chairman of the convention, assisted by various committees of PENC members.

The highlights of the professional action taken and reports received during the meeting are as follows:

Chapter Activities—D. C. Peters, P. E., reporting.

As outlined in our previous report the Committee has prepared and issued to all Chapter Presidents a copy of—"Welcome, Mr. President." This booklet is designed to be an inspirational introduction to the myriad duties and responsibilities that a Chapter President faces and should be sent in the future to each Chapter President immediately on his election to be most effective.

The Committee has also distributed the first issue of the Chapter Activities Guide entitled—"Helping the Young Engineer." This monograph was designed to provide each Chapter Young Engineers Committee with a specific program of things that can be done to stimulate the Young Engineer's interest in our Society and to aid him in his professional development. The monograph can also be used to provide tangible proof to the Young Engineer of the Society's efforts in his behalf and thereby sell him on the Society.

The Committee is preparing eight additional monographs covering the following:

1. Meeting Attendance and Fellowship
2. Legislative Committee Activities
3. Chapter Publications
4. Ethical Practice
5. Interprofessional Relations
6. Membership
7. Ladies Auxiliaries

The above are being prepared in cooperation with the various N.S.P.E. Committees involved.

The Committee also wishes to call attention to the trend toward standardizing the change in Chapter Officers to late spring and early summer.

It is becoming increasingly apparent that a change in Chapter Officers before the summer lull gives the new officers the entire summer to organize for a continuous nine or ten months of activity through the winter.

Board Action: Report received.

Constitution and Bylaws—W. E. Christian, P. E., reporting.

Life membership.—Members are probably familiar with Bylaw

24-d, which was adopted in November, 1953, at Indianapolis. This Bylaw provides for Life Membership for those members who have reached age 65, and have been Members of the Society for fifteen years. Historically, it is believed this amendment was first proposed by the Arkansas Society. Their particular interest was on behalf of members who had become incapacitated.

We have arrived at the conclusion that, if permitted to remain in effect, this Bylaw would very probably become an intolerable financial burden in years to come.

It is planned, therefore, following recommendations of the Executive Committee, to present to this Board, at the Annual Meeting, in June, amendments providing eligibility for Life Membership after reaching age 70 and minimum of twenty years continuous membership.

It is proposed also to offer an amendment, making eligible to Life Membership those members who because of age or disability may have retired from active practice. It is considered advisable that these be treated upon an individual basis and judged upon their merits, probably by the Executive Committee, if agreed upon by this Board.

Board Action: Report received.

Employment Practices—George DeMent, P. E., reporting.

The committee recommends that the NSPE Board, by instruction to its Legislative Committee for proper implementation and action, affirm the following statements:

1. NSPE favors the retention of Taft-Hartley Law Safeguards to Professional Engineers in the Construction Industry.
2. NSPE favors the retention of the Taft-Hartley Prohibition of the Closed Shop as it affects Professional Engineers.
3. NSPE favors retention of Taft-Hartley provisions for Decertification Elections as they affect interests of Professional Engineers.
4. NSPE recommends that Federal Classification Act be amended to require:

   Engineers in Grade 13 and above shall be registered, except that present holders of Grade 13 and above shall be exempted from this requirement.

5. The "P" (Professional) designation, or some other special designation, should be used for Engineers in Federal Government employ so as to separate them from General Service Employees and thus allow separate considerations, economic and otherwise, in order to maintain a high level of Engineering Services for the Government.

Popular regional luncheons were again held. Starting right top, proceeding clockwise, the groups are: Southwestern, North Central, Northeastern, Central, Western, and Southeastern.

6. NSPE should testify in favor of appropriate pay increases for Federal Engineering Employees by the presentation of facts on Federal Engineering salaries as compared to non-Federal salaries.

Board Action: Report received.

Engineer-In-Industry—Robert A. Blackburn, P. E., reporting.

The first phase of the Engineer-in-Industry Committee program has been completed. This step of the program, first announced a year ago at the Albuquerque, N. M. meeting, comprised the preparation and publication of a book devoted to an analysis of the problems of the industrially employed engineer together with suggested methods of resolving these problems.

The committee feels that its work along this line has been highly productive. In order for its work to have the maximum benefits for engineers in industry, every effort must be expended in the distribution of the book "A Professional Look at the Engineer in Industry." (See page 16—Editor.) Its distribution should be widespread with particular stress on its availability to industrial managements.

Board Action: Report received.

Ethical Practices—J. B. McGaughy, P. E., reporting.

The four-month interval since the October 15-16 meeting has been used by the Ethical Practices group to set in motion the program outlined in their report to that meeting. It will be recalled that the program contemplated four phases of professional conduct:

1. General advertising practices.
2. Relationships with other professions.
3. Competitive bidding for services.
4. Adoption of the ENGINEERS' CREED.

Some work has been done in each of these categories, but because of its scope and importance the major effort of the committee has been addressed to Item 1. Up to this time the members have been engaged in the exchange of opinion and comment, hampered, unfortunately, by the necessity of conducting their business by mail and at long range.

The plan of the advertising study is to analyze all forms and manner of advertising that are open to and employed by the engineer and to determine if, when and how he may appropriately and properly employ them. This work is now in progress.

A special phase of this study, one which has continued from the works of earlier committees, is that dealing with proper listings in classified telephone directories. As of this date the Society has adopted a position in regard to this form of advertising and has recommended, to the several states, firm contact with the local companies that the Society proposal shall become standard and universal practice. The committee now seeks to determine how effectively this is being accomplished.

The subject of competitive bidding for services has been given particular attention because of a communication from President Scott Turner, P. E., of the American Institute of Consulting Engineers outlining the formal position of that organization against the practice and in favor of the procurement of services through negotiation. Engineer Turner indicated that his organization was prepared to join with other societies to advance this position and suggested that the Engineers Joint Council might be the initiating agency. His letters were forwarded to this committee for study.

The thoughts of the committee on this question are summarized as follows:

1. The position of the Society on competitive bidding has been well established for quite some time. That position is firm and requires no changing.

2. Violations of that position are contrary to Society policy and action should be taken, when and as necessary, against both the agents requiring the violation and those acceding to it.

3. The position taken by the American Institute of Consulting Engineers (and incidentally by the American Society of Civil Engineers) is consistent with the firm position of N.S.P.E. Certain members of the committee feel that N.S.P.E. should specifically indicate to these organizations their support of the actions taken.

4. The committee is evenly divided on the question of turning the initiative for corrective action over to another organization (or group of organizations) or of assuming the initiative ourselves. The committee is agreed, however, upon cooperation with any and all organizations intent upon condemning and removing the practice.

In view of the above opinions in committee and the difficulty of resolving the matter more closely by mail, the chairman recommends that N.S.P.E. notify any organization that is directly concerned with the elimination of competitive bidding for engineering services that this Society is prepared to join with them to determine proper and necessary corrective action, which action shall be taken thereafter according to the wishes of the respective societies. Under such an arrangement the attack will carry the force of common agreement and the manner of the attack will be determined to fit the occasion.

Board Action: Report received.

Interprofessional Relations—R. A. Freese, P. E., reporting.

The Interprofessional Relations Committee has developed tentative drafts of the following three documents:

1. Standard Form of Agreement Between Architect and Engineer.
2. Standard Form of Agreement Between Engineer and Architect.
3. Interprofessional Code of Practice for Architects and Engineers.

Due to the fact that the three documents are concerned with the subject of Architect-Engineer relationship, it would be advantageous to submit all to the Board of Directors at one time, or at least the first two. We anticipate that our work with AIA on these matters can be completed in time for submission of these documents at our Annual Meeting in June.

Board Action: Report received.

Legislative—Virgil E. Gunlock, P. E., reporting.

Social Security. At the Omaha meeting the Board directed that this item of legislative interest be further investigated with particular emphasis on the possible benefits to be derived from social security coverage by self-employed professional engineers, and that the matter be placed on the agenda for this meeting for Board decision as to NSPE policy.

This further analysis has been made and the matter of benefits was analyzed and reported in the Legislative Bulletin of November 30, 1954. The basis of our recommendation on this point is a practical one—both major political parties have endorsed the idea of extending social security coverage to the fullest possible extent; in the face of this consideration it is exceedingly unlikely that any legislation to reduce coverage now provided would be seriously considered. In the face of this situation, plus the consideration that many NSPE members and other self-employed professionals have indicated a desire for social security coverage, even though a small majority indicated opposition in a poll more than a year ago and before the benefits were enlarged, it is felt that our objective should be along more constructive lines.

If the Board approves the policy recommended at this time the Legislative Committee would support legislation at the opportune time with the objective of insuring that self-employed professionals and others covered by the social security system, would receive without question their retirement benefits upon reaching the prescribed age and without regard to the amount of outside earnings or the length of time the individual remains in active practice.

Taft-Hartley Act and "Freedom of Association" Bill—Representative Kearns has re-introduced the previous legislation and NSPE will continue its support under existing Society policy.

Retirement Fund Legislation—The Jenkins-Keogh Bills to permit self-employed and pensionless persons to build a private retirement fund have been re-introduced and existing Society policy calls for continued support of such measures.

Board Action: Approved Social Security recommendations and accepted entire report.

Engineering Manpower—Virgil E. Gunlock, P. E., reporting.

The Special Committee on Engineering Manpower was appointed by direction of the Executive Committee at its January, 1955 meeting in Washington, D. C., to consider the over-all questions of national manpower policy with respect to the engineering profession. The Special Committee has reviewed the major suggestions in this area and the Administration's pending National Reserve Plan in the light of existing NSPE policy that "the total welfare and security of the United States, and not the best interests of any group or individual is the basic consideration for all questions to be resolved. . . . ."

We present to the Board the following opinions as a basis for current NSPE policy and as a basis for NSPE testimony to the Congressional committees:

1. The basic concept of equality of obligation for military service is sound and should be continued. To single out a select group of persons to be excused from military service means that others will have to take their place. However, in the best interests of the country's defense it may well be expedient to defer as discussed hereinafter certain engineering or scientific personnel.

2. A program of universal military training has been long dis-

cussed, but it is not considered that such a step is likely of adoption now.

3. The continuation of Selective Service for another four years is practically assured of Congressional approval. The impact of Selective Service inductions is not the primary factor bearing on the question of engineering manpower supply. It is suggested that the engineering profession would be well advised to do everything possible to encourage young men who are considering an engineering career to obtain their military service through Selective Service or otherwise before entering engineering school.

4. The student deferment program as it now operates has been of major importance in maintaining a flow of future engineers and scientists. The National Reserve Plan will continue this program and that decision is fully supported.

5. Continued deferment for engineering and science students qualified for and desirous of taking graduate study is vitally important. All possible means should be taken to impress upon local Selective Service Boards and the Selective Service appeals bodies the necessity for training in graduate work.

6. The establishment of engineering and scientific advisory groups to State Selective Service operations is commended and encouragement should be given to expanding the advisory bodies to every State.

7. One of the more serious problems which will be encountered in administering the standby reserve force, particularly in the event of hostilities, will be the determination of whether a specialized reservist is more essential in his occupation than in uniform. It is suggested that immediate steps should be taken upon the adoption of the National Reserve Plan to establish a high-level National Engineering and Scientific Personnel Advisory Board. This Board, which should be composed of eminent persons in the engineering and scientific professions, including those experienced in industry, government, education and the military, should be under civilian control, probably under the jurisdiction of the Office of Defense Mobilization. Its function should be to recommend basic national policies with respect to the essential nature of certain engineering and scientific occupations from the standpoint of national defense. These policies, when approved by the Director of the Office of Defense Mobilization, should be transmitted by him to the President for promulgation as national policies binding upon Selective Service and the military departments.

Board Action: Report received.

Membership—A. H. Kidder, P. E., reporting.

The Membership Committee is convinced that the most important immediate step which the National Society can take in support of its Membership Campaign now under way in an attempt to get off dead-center, is to adopt the following revision of the proposal which was approved in principle at Omaha. This recommendation has been framed with the assistance of the Chairman of the Budget Committee. It is our firm conviction the first refunds can be authorized for payment in 1956, as determined by results achieved during the year 1955, without risk of incurring any financial embarrassment to the Society.

Encouragement of Needed Extra Effort in Membership Activities

It will be recalled that the Board approved in principle the Committee's Omaha proposal that some part of the increase in National Society dues receipts attributable to membership gains be refunded to the State Societies for their assistance in financing sorely needed extra effort in membership activities. The matter was then returned to the Committee for review, clarification of details, and a report at this meeting.

Recommendation: To assist State Societies in their membership promotion and delinquency prevention activities which are almost exclusively local Chapter functions, the National Society will refund to each eligible State Society within 60 days after the end of each calendar year, a portion of its Professional Engineer Members' current and delinquent dues payments to the National Society during the year; said portion to be equal to the amount by which 95 per cent of said State Society's dues payments during the calendar year have exceeded the corresponding dues payments during the preceding year, after adjustment only as necessary to exclude the effect of dues increases if any were paid by members of record at the beginning of said calendar year and provided that the State Society has established its eligibility for such refund by indicating in writing to the National Society that this money will be apportioned to the Chapters of the State Society on the same basis where applicable.

Under this proposal, the total refund would have been approximately $12,900, or a little more than $4.00 per member net gained in 1953, but there would have been practically no refund in 1954, although a few States probably would have qualified for some refunds even in this year of extraordinarily unsuccessful membership activity. It is quite apparent, however, that the aggregate total of the refunds earned in 1954 under the revised proposal would have been well earned and could have been paid without embarrassing the treasury.

It is the Membership Committee's firm conviction that adoption of the foregoing recommended proposal is essential and can be effected without risk of significantly increasing the financial burden upon the treasury.

Board Action: Report received.

National Engineers' Week—A. G. Gruehr, P. E., reporting.

Because of the growing complexity of the National Engineers' Week program, it would appear appropriate to present a progress report at this time, and merely to list under appropriate headings a few major activities already carried out as well as some contemplated efforts of particular interest.

External Promotion:

1. Through the efforts of the NSPE headquarters staff, a special message from President Eisenhower was received.

2. The response to all letters sent to industry, publishers, radio and TV executives, and engineering colleges, has been most warm. It will be recalled that these letters were written on letterheads listing as sponsors of the National Engineers' Week the following eminent engineers:

Vannevar Bush, President
Carnegie Institution of Washington

Charles F. Kettering
General Motors Corporation

Thomas E. Murray, Commissioner
U. S. Atomic Energy Commission

Philip Sporn, President
American Gas & Electric Company

Robert E. Wilson, Chairman of the Board
Standard Oil Company of Indiana

Allen B. DuMont, President
Allen B. DuMont Laboratories, Inc.

Clarence H. Linder, Vice President
General Electric Company

Royal W. Sorensen
California Institute of Technology

David B. Steinman
Consulting Engineer

As a result of these mailings, many of the leading firms are participating in the celebration as well as the Nation's radio and TV networks. Leading newspapers have indicated interest, and several editorials have already appeared with more promised.

3. A letter requesting cooperation has been sent to the 2,200 members of the American Association of Advertising Agencies. Many letters were received from these leading agencies indicating a desire to cooperate.

4. A mailing has been made to more than 550 of the leading firms in the United States. This mailing offers specific promotional aids as well as containing copies of President Eisenhower's special message.

Internal Assistance:

5. More than 1,200 copies of the National Engineers' Week promotional kit have been distributed to the state societies and local chapters as well as to many engineering groups outside of NSPE which have indicated a desire to participate.

6. Announcements of the availability of 8 promotional aids have been circulated among the states and chapters. These aids have been sold at nominal cost. As of February 1, and with nearly 3 weeks to go until the Week itself, the demand for these aids has been most encouraging. By February 20 it is expected that requests will in most cases be nearly double those received for the 1954 celebration. Totals as of February 1 are as follows:

Small posters	10,600
Large posters	1,685
Banners	530
Seals	187,460
Radio tapes	157
TV slides	162
Mats	346
Logotypes	91

Board Action: Report received.

Publications—Vincent F. Waters, P. E., reporting.

A meeting of the Publications Committee was held in Washington, D. C., on Friday, November 5, 1954.

PENC Hosts at Gay Banquet . . .

This scene of the head table shows, l. to r., General Chairman and Mrs. John Bolen; incoming PENC President and Mrs. B. O. Vannort; PENC President and Mrs. E. C. Hubbard; NSPE Treasurer and Mrs. Russell B. Allen; V. P. Orland Mayer; V. P. and Mrs. Lewis Frazza; Mrs. Clarence T. Shoch; Guest Speaker Hal Hale; President Shoch; The Rev. W. Moultrie Moore, Jr.; and V. P. and Mrs. Frank W. Wooten.

The meeting opened with the report of Austin LeStrange, New York advertising representative for the last few months. Mr. LeStrange reviewed the operations of the New York and Chicago offices in relation to the AMERICAN ENGINEER. He pointed out that the major problem at the moment in selling advertising in the AMERICAN ENGINEER was the fact that although 19 years old, the magazine still carries little advertising. Prospective advertisers want to know why after all this time there is so little advertising in the magazine "if the magazine is as good as you say it is." These arguments, of course, are answered by pointing out that advertising solicitation has been vigorously encouraged only in the past year or two. Mr. LeStrange feels that once initial advertising has been secured that the rest will come much easier.

Mr. LeStrange pointed out that because the AMERICAN ENGINEER must be sold to very high level industrial accounts that some months will have to be spent by his salesmen in working up convincing sales stories. He feels that good progress is now being made in this direction.

Generally speaking, Mr. LeStrange sees increased business for the AMERICAN ENGINEER in 1955, but with more encouraging results to show up in 1956.

Possibly the following data will be of interest to the Board:

	Advertising Income	
1952	*1953*	*1954*
$9,385.00	$12,972.43	$18,585.25

Percentage increase 1954 over 1952 ..... 97.4%
Percentage increase 1954 over 1953 ..... 42.8%
Percentage increase Professional Directory Cards, 1954 over 1952 ..... 141.9%

The committee feels that the Washington meeting was most worthwhile. It was suggested to the editor to the chairmen of all national committees be contacted and urged to report news stories on some of their more outstanding programs for use in the AMERICAN ENGINEER. Further, it was suggested that action as to some type of award for outstanding articles submitted to the magazine by professional engineers be withheld until more details can be worked out with the Awards Committee.

Board Action: Report received.

Public Relations—G. W. McCullough, P. E., reporting.

The scope of the National Society's Public Relations efforts since the October report to the Board of Directors has been mostly in the direction of implementing the general policies outlined in that report.

The writing and production work handled by the headquarters staff can be classified in four major areas:

1. Public Relations Newsletter—This publication has been enlarged to include actual examples of newspaper publicity obtained by local chapters. An attempt has been made to use the Newsletter to give wide circulation throughout the Society to successful ideas in public relations.
2. Assistance in the preparation of material for the 1955 National Engineers' Week—A full report on this phase of the staff's work is made in the report of the National Engineers' Week Subcommittee.
3. News releases—A considerable number of news releases were written and distributed to the newspaper press, the business, trade, and technical press, and to a selected list of national associations. These releases covered articles in the AMERICAN ENGINEER, as well as policies adopted and action taken by the National Society. Special releases, speeches, and the like, were prepared for various officials of NSPE.
4. PR program for the fourth Executive Research Survey Report, "How To Train Engineers in Industry."—An extensive PR program for the publication of this report was developed in cooperation with the Professional Engineers Conference Board for Industry.

Board Action: Report received.

Registration—Orland C. Mayer, P. E., reporting.

The Registration Committee developed and reproduced a comprehensive questionnaire designed to collect information relative to opinions concerning engineering registration laws. This questionnaire was mailed to two groups within the Society membership:

Group I—Included officers, Board of Directors, Committee Chairmen, Members of the Conference Board, State Presidents, State Secretaries, Chapter Presidents and Chapter Secretaries.

Group II—Random sampling of membership.

In addition to one section of the questionnaire which was designed to produce information, such as, date of first engineering registration; how were you registered; what is your principal activity; branch of engineering; etc., the questionnaire was divided into six general headings:

—Organization of State Boards
—Financial Considerations
—Powers of the Board and Enforcement
—Standards and Reciprocity
—Qualifications of Applicants
—Fees

At the outset, it should be pointed out that there was no appreciable divergence of opinion between the individuals in Group I and Group II.

A detailed analysis of the returns will be made by the Registra-

Kentucky Court Rules No Registration Exam Necessary If Experience Is Adequate

Where the state law provides that an applicant *shall* be licensed to practice his profession without examination upon the showing of necessary experience qualifications, the state licensing board may not require an examination, according to a ruling of the Court of Appeals of Kentucky.

The case involved the application of the architectural registration law, but the principles expressed are of related interest with respect to engineering registration statutes. One section of the Kentucky statute provides that the board shall issue a license without examination to any applicant possessing certain residence qualifications "who has had at least ten years' satisfactory experience in the office of a reputable architect, during three years of which he has had responsible charge of work, and who in the opinion of the board is qualified to design as well as direct architectural work."

August Baker made application under this provision, together with supporting data, including architectural designs, plans and blueprints he had prepared and affidavits and certificates from licensed architects with or for whom he had worked. The board declined to evaluate the data submitted or make any separate investigation of Baker's experience, insisting that it could not pass upon his qualifications except by means of the regular four-day written examination. The board relied upon the phrase of the statute which related to its opinion as to his qualifications and the words, "satisfactory" and "responsible," which it was contended contemplate an evaluation that cannot be made without examination.

The Court of Appeals rejected these arguments, holding that the law "says clearly and positively that the license shall be issued 'without examination.' And it says that the board 'shall' issue the license without examination."

The Kentucky appellate body said that, although the law is to some extent ambiguous and contradictory, "we think it may fairly be interpreted to mean that the board shall form an opinion as to the applicant's qualifications on the basis of the data submitted with the application and such independent investigation as the board may consider necessary to establish the truth of the facts stated in the application concerning the extent, nature and quality of the work the applicant has performed."

The board was ordered to act on Baker's application as submitted. "It will be assumed, of course, that the board will not act arbitrarily or capriciously in passing upon Baker's qualifications."

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tion Committee and will be presented in subsequent reports, published in the AMERICAN ENGINEER.

Board Action: Report received.

Young Engineers—E. W. Carlton, P. E., reporting.

The Young Engineers Committee has completed the survey of the Member State Societies, relative to the status, interest and active participation of the young engineer members in the work and activities of the various State Societies. While the Committee has not been able to secure 100% response to our questionnaire, we feel that obtaining replies from 30 out of the 38 State Societies represents that considerable interest was evidenced in this questionnaire.

A careful study of the comments will reveal that much progress is being made, although our chief weaknesses to date might be classed as: 1: Lack of any special program for assistance in development of the young engineer; 2: An alarmingly low percentage of membership in the EIT classification; 3: Lack of any active program of recruitment for young engineer members; and 4: Failure to encourage full participation of young engineer members in State Society activities.

No action at the National level is recommended by the Committee at this time, as we feel that sufficient latitude has been granted State Member Societies by the National Society to permit them considerable latitude in developing a special program for the young engineers which will meet their particular needs.

Board Action: Report received.

Resolutions—R. J. Rhinehart, P. E., reporting.

TO THE
BOARD OF DIRECTORS—FEBRUARY 18-19, 1955

Resolution 4-55
Responsibility of State Societies re: Registration Laws

WHEREAS, the engineering registration laws of the states, territories, possessions and districts of the United States are predicated on the protection of the public health, safety and welfare, and

WHEREAS, the National Society of Professional Engineers and its Member State Societies along with other learned professions recognizes that the public interest requires the licensure of qualified individuals who offer their professional services to the public, under state laws duly enacted by the legislative bodies representing the public, and

WHEREAS, the authority for the enactment and enforcement of the engineering registration laws lies in the exercise of the police power of the individual jurisdictions, and

WHEREAS, the engineering registration laws are written and revised from time to time by the appropriate jurisdictions in accordance with appropriate local conditions and subject to the prevailing opinion of the engineering profession and the legislatures of the appropriate jurisdictions, and

WHEREAS, it is desirable that the engineering registration laws be subjected to improvement by amendment in accordance with local conditions and circumstances, and,

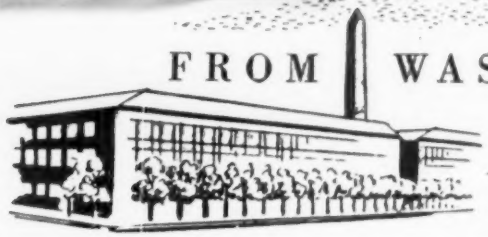
WHEREAS, the Society of Professional Engineers of each jurisdiction is best qualified to evaluate revisions to the engineering registration laws by reason of experience and representation of the opinions of the local engineers based on practical knowledge, and

WHEREAS, Article III, Section 2 of the Constitution of NSPE provides, in part: "In all matters of state or local concern, the Member State Societies have full autonomy . . ."

NOW, THEREFORE, BE IT RESOLVED, That the National Society of Professional Engineers affirms the responsibility and right of each member State engineering society to recommend and support those amendments and revisions to the state engineering registration law which it considers will best serve the public interest, and

BE IT FURTHER RESOLVED, That the National Society of Professional Engineers supports its State Societies in any attempt to obtain revision of its engineering registration law, in which the licensing of qualified individuals to practice engineering is the basic concept of professional status, irrespective of the type of business organization in which the professional engineer is a member.

Board Action: Resolution approved.



FROM WASHINGTON

By
Milton F. Lunch,
N.S.P.E.'s Legislative Analyst

"RIGHT TO WORK"

A relatively quiet aspect of the Taft-Hartley labor-management relations law has erupted into major political warfare. There is not even agreement among the protagonists about the proper terminology for the battle. One side says that the issue is continuation and enlargement of the state "right to work" laws. The unions retort that the issue is the "right to wreck" (unions) state laws.

Both sides have reference to two aspects of so-called union security provisions as permitted by federal and state law. The Taft-Hartley Act outlawed the closed shop, which required that a prospective employee be a member of the union before he could secure employment. But it permitted, with certain safeguards, a union shop, whereby a person does not have to be a member of the union to obtain the job, but must, where the agreement applies, become a member of the union within a certain number of days after employment commences (usually 30 days).

The Taft-Hartley Act also provided, however, that "nothing in this Act shall be construed as authorizing the execution or application of agreements requiring membership in a labor organization as a condition of employment in any State or Territory in which such execution or application is prohibited by State or Territorial law."

In other words, a state legislature may go beyond the restriction of the federal law and impose even more stringent controls over compulsory union membership in any form. Seventeen states, as shown on the map, have acted under this authority and have prohibited the union shop and other forms of compulsory union affiliation within their borders.

Mitchell Attacks State Laws

The current high-tension controversy over this situation was touched off by Secretary of Labor James P. Mitchell in an address before the annual CIO convention last December when he unloosed an unexpected criticism of the state "right to work" laws. Secretary Mitchell said that he was opposed "categorically" to the state laws because "these laws do more harm than good . . . they result in undesirable and unnecessary limitations upon the freedom of working men and women and their employers to bargain collectively . . . they restrict union security and thereby undermine the basic strength of labor organizations."

Shaded states have "right to work" laws

Secretary Mitchell suggested that the seventeen states having the "right to work" laws further consider them in the light of his criticism. He did not ask for or suggest the repeal of the provision of the Taft-Hartley Act which makes the state laws possible, the most direct route to declaring the state laws null and void. His reason for suggesting state rather than federal action was that it would be politically impossible to secure Congressional action on the controversial clause of the federal law. When asked about Secretary Mitchell's statement, President Eisenhower replied that the Administration had not arrived at a final position on the matter, but that Mitchell had the right to express his own convictions while the question was unsettled as a policy matter within the administration.

Since that time both sides have been girding for the fight at both federal and state levels. These have been the major developments:

• A National Right To Work Committee, headed by former Representative Fred A. Hartley, Jr., has been formed to preserve the Taft-Hartley "state right" provision and to seek extension of the state laws to the other states.

(Please turn the page)

(Continued from previous page)

• The CIO has issued a 171-page attack against the "right to work laws," entitled, "The Case Against 'Right To Work' Laws," calling them "utterly obnoxious" and a "menace" to organized labor.

• The National Association of Manufacturers and the U.S. Chamber of Commerce have declared that they will fight vigorously attempts to repeal the Taft-Hartley provision or the existing state laws.

• Representative James Roosevelt of California and Senator James E. Murray of Montana have introduced legislation to void the state restrictive laws.

• Both sides have girded for all-out fights in the state legislatures, most of which meet this year.

The union groups are seeking repeal of the "right to work" laws in the seventeen states and the blocking of their extension to other states. Their opponents are defending the existing state laws and seeking similar laws in the other states.

May Affect Engineers

The controversy has a direct potential interest to employed engineers in view of the announced policy of Engineers & Scientists of America, the engineers' union federation, to have their collective bargaining units seek union shop agreements or other forms of compulsory union affiliation. According to an ESA official, two of their member units now have union shop agreements with their employers, which means that all engineers represented by the unions must become members of that group regardless of their desires.

It is generally predicted that Congress will take no action on the controversial section of the law this year, and, in fact, it is widely believed that the intense debate will be a major factor in the refusal of Congress to act on any amendments to the law during the present session.

APPLICATION OF WAGE-HOUR ACT TO ENGINEERS

Another area of conflict in the labor legislative field relates to proposed amendments to the Fair Labor Standards (Wage-Hour) Act. The administration has announced support of an amendment to the law to raise the minimum wage from 75¢ to 90¢ per hour. It has also indicated that it will support some extension of the law to now-excluded employees, but the details of this change have not been clarified.

Of particular interest to professional engineers is the fact that when the law is brought up for the administration-sponsored changes, other attempts will be made to enlarge it in two ways which will have a direct bearing on employed engineers and possibly on consulting engineers.

The proposed change affecting employed engineers is that introduced by Senator Herbert H. Lehman of New York and Representative Roy W. Wier of Minnesota to tighten the qualifications for designation as "professional employees," who are exempt from the minimum wage and maximum hours provisions. The Lehman-Wier bill would continue to exempt employees in a professional capacity, but only if they earn, on a salary basis, at the rate of $6000 per year. The present law leaves it to the administrator to define "professional employees" and he has issued a comprehensive definition based on the type of work performed, plus the requirement that the professional employee must be paid not less than $75.00 per week.

Should the proposed provision be adopted some now-exempt professional engineers would become eligible for time-and-a-half payments for all time worked over 40 hours per week.

The potential affect of the proposed changes on consulting engineers is not quite as clear a case. Basically, what is proposed is to liberalize the language relating to coverage of the law and thus make it applicable to more of those employers who are presently construed to be outside of its coverage. The Labor Department has attempted in a number of cases to apply the law to consulting engineers and has been rebuffed in two such attempts (See American Engineer, January, 1955) on the ground that the performance of professional services by a consulting engineer does not constitute activity within the present language of the law. The latest decision to this effect (Mitchell v. Brown) has now been appealed by the Labor Department to the United States Court of Appeals. The forthcoming decision of the Court of Appeals will be the first from an appellate body and will provide a more authoritative judicial answer to the question of the application of the law to consulting engineers.

Meanwhile, the pending legislation, if enacted, will be of major importance in the eventual decision on this point, for it clearly is intended to broaden the scope of coverage to all "activities affecting commerce," instead of the present application only to employees engaged in commerce or in the production of goods for commerce. The technical difference in the language employed with respect to coverage may well determine in the future whether consulting engineers must comply with the Wage-Hour law.

NSPE State Presidents Will Meet in Champaign To Exchange Views

The Allerton Estates, Champaign, Illinois, will be the scene of the 1955 NSPE State Presidents' Conference on March 18 and 19, according to a national headquarters announcement.

The meeting of the presidents of the state society components of the National Society of Professional Engineers is an annual event devoted to the exchange of information helpful in the administration of the state organizations. In addition, national officers and committee chairmen also are on hand to present first-hand information on national programs and general professional matters.

The 1955 meeting will be climaxed with the annual State President's Banquet on March 19. Dr. William L. Everitt, dean of engineering at the University of Illinois, will be the guest speaker for the occasion. It is expected that the banquet will attract many local Illinois SPE members in addition to the official state society delegates to the conference.

NSPE State Presidents' Conference—March 18, 19, 1955, Allerton Estates, Champaign, Illinois.

Ohio Society of Professional Engineers—Annual Meeting, March 24-26, 1955, Sheraton-Gibson Hotel, Cincinnati, Ohio.

Illinois Society of Professional Engineers—Annual Meeting, March 31 to April 2, 1955, Hotel Faust, Rockford, Illinois.

New Jersey Society of Professional Engineers—Annual Meeting, April 22, 23, 1955, Essex House, Newark, New Jersey.

New York State Society of Professional Engineers—Annual Meeting, May 12-14, 1955, Commodore Hotel, New York, New York.

NSPE Annual Meeting—June 2-4, 1955, Bellevue-Stratford Hotel, Philadelphia, Pennsylvania.

Pennsylvania Society of Professional Engineers—Annual Meeting, June 2-4, 1955, Bellevue-Stratford Hotel, Philadelphia, Pennsylvania.

California Society of Professional Engineers—Annual Meeting, June 2-4, 1955, Statler Hotel, Los Angeles, California.

Michigan Society of Professional Engineers—Annual Meeting, June 9-11, 1955, Gratiot Inn, Port Huron, Michigan.

Georgia Society of Professional Engineers—Summer Meeting, June 17, 18, 1955, General Oglethorpe Hotel, Savannah, Georgia.

NSPE Senate Testimony Treats Federal Salaries

The following testimony was given recently before the Senate Committee on Post Office and Civil Service by Paul H. Robbins, Executive Director of the NSPE. ***—Editor.***

. . . We are concerned with the question before this Committee not only because some of our members would be directly affected, but in a more important sense because of a recognition of the problem faced by the Federal agencies in securing and retaining professional engineers for important work. It is well known that the increasing technological complexity of our industrial production system and our national defense organization, both military and civilian, has been felt in the operations of the Federal agencies and they, too, are requiring increased numbers of highly-trained and experienced engineers and scientists. It is likewise a well-known fact that the agencies of the Federal Government have had the greatest difficulty in recent years in securing the services of engineers and scientists and, in fact, in some cases have lost experienced technical personnel to more attractive offers from industry and other private organizations. The same problem has existed, and still exists, with respect to state and local governments.

The National Society of Professional Engineers has stated, and repeats today, that it is in the public interest, and therefore in the interest of the engineering profession, that our Federal Government is entitled to and should be in a position to secure the very best engineering and scientific talent which is available in order that our country's interests may be furthered in the fields of national defense, economy and efficiency. In order to assure this it is the feeling of this Society that these are several factors involved:

Economic Status

Undoubtedly one of the major factors is the discrepancy between the salary levels for professional personnel as between the Federal service and private industry. The Committee already has before it an excellent and comprehensive study of the comparison of pay levels for engineers and scientists in the Federal service compared to private industry, and private research organizations. We refer, of course, to the Committee's publication, "Study of the Shortage and Salaries of Scientists and Engineers," published in 1954. The accumulated data in that report contains convincing evidence that an adjustment of the salaries of engineers and scientists in the Federal service is in order and is required if the government is not to fall further behind in its effort to obtain and retain competent engineering staffs. The report refers to the salary survey conducted by the National Society of Professional Engineers for 1952 and observes that the findings at that time indicated that engineers in the federal services were paid at a rate 15 percent lower than private industry. The over-all median income of engineers in the Federal Government as shown by our survey was $7,300 compared to $8,420 for private industry. It is also noted that based on the same data the salaries of engineers in the Federal service were lower than those applicable to engineers in public utilities, education, private practice and contractor organizations. The only cases in which the reverse situation was true was in the case of state and county or municipal governments.

With respect to the salary level of engineers and scientists there would appear to be no question but that a salary increase along the line being considered by the Committee is justified and necessary.

The National Society of Professional Engineers is now conducting a further salary survey similar in scope and coverage to that mentioned above for 1952. As soon as this data has been collected and analyzed a copy of the results will be furnished to the Committee for general information.

Professional Status

As previously stated, we believe that the basic problem of the Federal Government obtaining and retaining sufficient numbers of qualified professional engineers involves more than salary considerations alone. A less exact, but highly important, element in this picture is the matter of professional status. By reason of their advanced training and adherence to a commonly accepted ethical standard imposed by the profession itself as a matter of self-discipline in the public interest, professionals have come to place a high emphasis on their identification apart from strictly occupational classifications. This is not meant to imply that a particular class is to be regarded as superior or entitled to preferential treatment, except as that separate identification and treatment may directly assist in better performance for the public welfare.

The fact of professional status does exist and it has been recognized almost from time immemorable that separate identification from other occupational groups is an important ingredient in maintaining and en-

(Continued on page 38)

MARCH MEETINGS Of Note

Steel Founders' Society of America—Annual Meeting, March 14-15, Drake Hotel, Chicago, Ill.

College of Engineering, University of Florida—Municipal and Public Health Engineering Conference, March 15-16, Gainesville, Fla.

Case Institute of Technology—Third Annual Symposium on Human Maintenance in Industry, March 16-18, Case Institute, Cleveland, O.

American Institute of Electrical Engineers—Technical Conference on Electrical Overhead Cranes, March 28-29, Cleveland Hotel, Cleveland, O.

Illinois Institute of Technology—Seventeenth Annual American Power Conference, March 30-April 1, Sherman Hotel, Chicago, Ill.

- - - NEW PROCESSES - - -

The World's Largest Drop-bottom Metal Treating Furnace

The world's largest drop-bottom, metal treating furnace of its type began operation recently at Metallurgical, Inc., commercial metal treaters located in Minneapolis, Minnesota.

Specially designed to vertically heat treat extra long parts, the furnace hardens, anneals, stress relieves and normalizes steel and aluminum. Controlled endothermic or neutralene atmosphere insures bright work and eliminates scaling. Three chart type recording instruments control the furnace temperature within plus or minus five degrees F. to 2200° F.

Distortion is kept to a minimum by vertical heating and then quenching in a 22 foot deep temperature-controlled, agitated salt bath.

The furnace is mounted on a carriage and moves along tracks over a pit, 25 feet deep and 60 feet long. The pit houses three agitator type quench tanks permitting quenching in water, martempering oil or hot salt. The water and oil tanks have a capacity of 6,300 gallons each, while the hot salt tank is charged with 105,000 pounds of molten salt. From bottom of pit to top of furnace is 55 feet.

Parts to be hardened are suspended from a fixture in the loading end of the pit, hoisted into the furnace through the bottom, and brought up to the specified temperature for the required time. The operator then moves the furnace over the desired quench—oil, water, or hot salt—and lowers the load into the quench at from one to ten feet a second.

The furnace was designed by the Loftus Engineering Corporation.

Magnesium Corrosion Resistance Increased

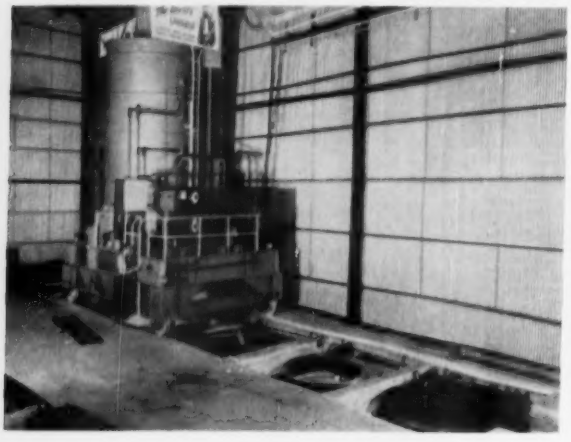
Magnesium, one of the modern metals with great potential, has been restricted to a degree in its application because of its susceptibility to corrosion.

There now appears to be a solution to this problem through a new impregnating process which is said to increase the metal's resistance to corrosion from 300 to 400%.

"Magseal," as the new process is called, was developed by the Nu-Line Plastic Impregnating Company of Los Angeles after two years of research. It is a resin combination which impregnates the metal in much the same manner as conventional impregnation.

Tests were recently conducted by different testing laboratories in Los Angeles using both magnesium alloy castings and sheet. Impregnated samples were subjected to continuous salt spray for periods up to 125 hours with no evidence of pitting or metal failure. With this increased corrosion protection around critical areas such as precision-fit spots where dissimilar metals touch, and in alloy castings with temperatures up around 450° F., much greater flexibility in the utilization of magnesium is anticipated.

In the process, after the metal is removed from the autoclave all parts are rinsed in an alkaline type cleaning solution. Polymerization is done in a pressure bake oven at 275° F., under 100 psi to prevent impregnant weeping. Upon removal from the oven all parts are placed in another alkaline type "stripper" solution that completely removes any remaining impregnant from all surfaces including tapped holes.



The "Vertical 752," world's largest drop-bottom metal treating furnace of its type, now operating at Metallurgical, Inc., is 9½ ft. wide x 22 ft. high with self-contained crane in gas tight housing. Three agitator type quench tanks in pit permit quenching in water, martempering oil or hot salt.

Court Holds For Texas SPE In Registration Suit

A consent judgement has been entered in favor of the Texas Society of Professional Engineers against the Fort Bend County Drainage District and a contracting firm as the result of a legal action by TSPE to determine whether a political subdivision may lawfully let a construction contract to be performed without professional engineering direction and for which plans and specifications were not prepared by professional engineers. (AMERICAN ENGINEER, November, 1954.)

The District Court of Fort Bend County, Texas, found that the drainage district caused to be prepared engineering plans and specifications and cost estimates for certain watershed improvements, and awarded a contract embracing the plans and specifications without securing the professional engineering services required by law in the case of public work involving professional engineering where public health, public welfare and public safety are involved.

The defendants agreed that the statute required that the plans and specifications and cost estimates be prepared by, and the engineering construction executed under the direct supervision of, a registered professional engineer entitled to practice in the state. The consent judgement provided that the drainage district will have a registered engineer review the plans and specifications and that the plans and specifications will be modified if the professional engineer deems such action necessary. ". . . such review and examination shall meet a standard of thoroughness as will enable said engineer to consider them the equivalent of having been prepared by him in the first instance." It was also agreed that the construction will be executed under the direct supervision of a professional engineer.

The court permitted the work to proceed upon strict compliance with the above requirements, the enforcement order to remain in effect until the drainage district submits evidence that the required steps have been taken.

Sorry . . . Lack of space has prevented us from using Professional Postscripts this month. Back in April, we hope.

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24. NSPE Constitution and Bylaws
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    Annual ET
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       Alex Van Praag, Jr., P.E.
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       Clark Ransom, P.E.
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N.S.P.E. Believes

ENGINEERS IN THE FEDERAL GOVERNMENT

BY PAUL H. ROBBINS, P.E.

Executive Director

N.S.P.E.

NSPE has long believed that the Federal Government, as well as other governmental jurisdictions, is entitled to the best in engineering services. The many ramifications of government activities provide extensive opportunity and need for engineers. A review of the many departments of the Federal Government shows that there are few indeed in which engineers are not currently employed, and in which engineering thinking is not extremely essential.

It has long been a belief of NSPE that greater recognition of registration would not only be salutary in creating a more favorable atmosphere for engineering development, but would enhance the position of the Federal Government in attracting and holding the competent engineers to which it is entitled.

As a result of studies of its Employment Practices Committee and with approval of the Board of Directors, NSPE has made several recommendations to the Congress in connection with legislation now pending in Congressional committees. The recent NSPE statement before the Senate Post Office and Civil Service Committee is reported elsewhere in this issue of the AMERICAN ENGINEER. In this presentation, and in the discussions at the Spring Meeting of the Society in Charlotte, emphasis was placed upon urging the recognition of registration as a prerequisite for the more responsible engineering positions in the Federal Government. It is encouraging to note that more and more recognition is being given to registration, both by Civil Service and by various Federal Agencies. Civil Service now provides on the familiar Form 57 for Federal employment, space for indication of an engineers' registration, and is announcing in its various employment circulars that registration will be given weight in evaluating an applicant's qualifications.

Varying degrees of emphasis, however, are being given in terms of evaluating potential candidates for higher Federal positions. It is NSPE's belief that, except for current occupants of Grade 13 or above, registration should be a requirement for promotion into these responsible engineering positions. This is not to say that registration is not desirable for lower levels of engineering activity. Registration is valuable to all engineers doing responsible engineering work. A number of NSPE members employed by the Federal Government have commented on the assurance they have felt in dealing with other members of the profession, because they, too, had met the requirements of State Engineering Registration Laws. NSPE believes all engineers in Federeal Government should enjoy this same assurance through recognition of their registration by all Federal Agencies.

The Federal Government, of course, has been handicapped in attracting and holding engineers through the classified salary scale under which the Government must operate. Two facets of this program are recommended by NSPE for revision. It is the Society's belief that to establish a professional classification in the Federal Civil Service, in which professional engineers would be recognized as a distinct professional group and through which special considerations for the unique conditions of their work could be recognized, would be a desirable step.

Correlated with this, of course, appropriate salary adjustments could be made, which are sorely needed to attract and hold competent engineers to Federal service. A recent report by the Senate Post Office and Civil Service Committee went into this problem extensively, and it is interesting to note that they quoted rather fully from the 1952 Salary Survey of NSPE. This is another indication of the service a professional society can render to Agencies of Government in accumulating and distributing pertinent facts on which Governmental decisions must be based. Good government requires accurate information. NSPE believes the profession can well serve government through support of activities such as this. It is to be hoped that the Congress will recognize the importance of engineering service to the people of the Nation, as exemplified by the high caliber of professional engineers in Federal employment. Such recognition should come in tangible form, through appropriate revisions of existing legislation and administrative procedures.

With Our Members . . .

National Engineers' Week

Coast to Coast Reports Indicate Most Successful Observance to Date

Early reports received in the AMERICAN ENGINEER editorial offices before the March issue went to press indicate that the 1955 observance of National Engineers' Week, February 20-26, has even surpassed the excellent record of the past several years.

Philadelphia was one of the cities where a proclamation was signed by the mayor in a special ceremony. Another event of note in the Quaker City was the awarding of the Philadelphia Chapter's "Engineer of the Year" citation to Harry A. Kuljian, internationally known engineer, president of the Kuljian Corporation, and a prominent member of the chapter. Mr. Kuljian was cited for his knowledge of world affairs and economics and for his keen interest in and understanding of the people of many nations, as well as for his technological accomplishments.

The Lake County Chapter of the Illinois SPE sponsored a very successful speakers' bureau that sent speakers before the Waukegan Chamber of Commerce, Jaycees, Rotary, Elks, and Exchange Clubs. In addition, the chapter arranged for the issuing of proclamations by the mayors of Waukegan, North Chicago, and Zion and sponsored a special supplement to the *Waukegan News-Sun*.

The St. Louis Chapter of the Missouri SPE was another NSPE affiliate achieving excellent newspaper coverage with several special stories in the *Construction Record*, monthly supplement to the *St. Louis Daily Record*. The chapter also arranged a very successful TV panel discussion on "Engineers in Municipal Government" as one of the many activities of the week.

Next Month . . .

Don't miss the final roundup of outstanding NATIONAL ENGINEERS' WEEK events which will be featured in the *American Engineer*. It is going to be a story of real accomplishment.

In Massachusetts, the official proclamation was signed by Governor Christian Herter while representatives of the MSPE looked on. In New York, the Albany County, Rensselaer County, and Tri-County Chapters held a joint dinner meeting, at which John W. Johnson, New York State Superintendent of Public Works, was guest speaker. The Reading Chapter of the Pennsylvania Society reported its sponsoring of guidance panel discussions at various high schools plus radio and television panel programs in which members participated.

The San Diego Chapter of the California SPE observed the Week by participating in the first "Science Fair" of San Diego, according to President Eugene A. Balas. The Fair, which was supported by many local industries and societies as well as educational institutions such as San Diego State College, emphasized the importance of engineering as a career and offered interested local high school students the opportunity to compete for prizes in a scientific competition.

Elsewhere in California, the Bay Area (San Francisco area) chapters joined with local technical societies in sponsoring a week-long program of events that included a series of meetings—termed "The 1955 Symposium of Engineering"—at which spectacular new color movies were shown under the auspicies of such large industrial firms as U. S. Steel, Bethlehem Steel, Westinghouse Electric, Pacific Gas and Electric, the Kaiser Corporation, General Electric, Southern Pacific, and U. S. Electrical Motors. Dr. J. E. Hobson, director of the Stanford Research Institute, was the featured speaker at the Engineers' Week dinner sponsored by the Bay Area Joint Committee, and William A. Patterson, president of United Air Lines, was the lecturer at a special luncheon similarly sponsored.

The Fresno Wives of Professional Engineers, auxiliary to the Fresno Chapter, cooperated in the observance by sponsoring a display in the Hotel

(*Continued on next page*)

ENGINEERS' WEEK PERSONALITIES—In the photo at the left, below, Glen Donaldson, a student at San Diego State College, is shown admiring a Science Fair trophy held by Eugene A. Balas, president of the San Diego Chapter of the California SPE. The San Diego P.E.'s participated in the fair as their part of the Engineers' Week Observance.

In the center panel, the top photo is that of Harry A. Kuljian, world-renowned engineer and president of the Kuljian Corporation, who was the Philadelphia Chapter's choice for the "Engineer of the Year." The lower picture is that of Mason Graves Lockwood of the Houston, Texas engineering firm of Lockwood and Andrews, who was selected for a similar award by the San Jacinto Chapter of the Texas SPE. A past president of the TSPE, Mr. Lockwood is closely identified with many important Gulf Coast engineering developments.

The picture at the right shows Governor W. Averell Harriman of New York signing that State's Engineers' Week proclamation watched by D. F. Langenwalter, president, Schenectady Chapter; Anatole R. Gruehr, chairman, NYSSPE Public Relations Committee, and NSPE National Engineers' Week Chairman; Herbert F. Roemmele, NYSSPE first vice president; L. W. Houston, president Rensselaer Polytechnic Institute; and Russell A. Wylie, vice chairman, public relations, NYSSPE.

Engineers' Week

(Continued)

Californian that featured engineering products used in the home.

Among the journals giving extensive publicity to the Week and its theme was *Toledo Technical Topics*, the monthly publication of the Toledo, Ohio, Technical Council, which featured a special message from NSPE President Clarence T. Shoch on its editorial page. President Eisenhower's letter to Mr. Shoch was published in many journals giving support to the efforts of the local NSPE affiliates in making the Week a success. Two such publications were *Akron Technical Topics*, the journal of the Akron, Ohio, Council of Engineering and Scientific Societies, and the *Tulsa Engineer*, bulletin of the Engineers Club of Tulsa. The latter organization turned the program of its February 21st meeting over to the members of the Tulsa Chapter of the Oklahoma SPE as a "kick-off" luncheon for the Week's observance.—***End.***

Rockford Chapter Installs Officers

Members of the Rockford Chapter of the Illinois SPE met recently to install new officers for the 1955 term. Those now directing the administration of the chapter are: Warner A. Johnson, president; John G. Duguid, vice president; and John K. Grubbs, secretary-treasurer. Mr. Duguid is also chapter representative. Newly elected chapter directors are Royce E. Johnson, Lyle B. Porter, and Stanley Cutler. Mr. Cutler is also editor of the group's monthly bulletin.

Brooklyn Polytechnic Is Honored By P.E.'s

The members of the Kings County Chapter, NYSSPE, sponsored a testimonial dinner in honor of the Polytechnic Institute of Brooklyn on February 24th at the St. George Hotel. The occasion for the dinner was the centennial celebration of the Brooklyn School.

Other New York chapters—Bronx County, Queens County, New York County, and Richmond County—cooperated in arranging the banquet, as did the Brooklyn Polytechnic Institute Alumni Association. In addition, many other engineering and technical societies and engineering schools participated in the event.

Archibald F. Glover was chairman of the committee in charge of arrangements, assisted by Joseph D. Lewin and Harold Becher as vice chairmen.

Wisconsin Meeting Held In Milwaukee

The twelfth annual meeting of the Wisconsin SPE was held at the Schroeder Hotel in Milwaukee, January 27-29. Functional group meetings were devoted to the discussion of various professional problems found in industry, education, public employment, and consulting practice.

Among the guest speakers who addressed various conference sessions were: Dr. Allen Abrams, vice president of the Marathon Corporation, Rothschild, Wis.; Dr. Fred Replogle of Rohrer, Hibler and Replogle, Chicago; Leo E. Brown, executive assistant for public relations, American Medical Association; and Don Hyndman, director of public relations, American Bar Association.

One of the highlights of the three-day meeting was the presentation of an award for outstanding professional achievement to Hans P. Dahlstrand of Wauwatosa.

A special program was also arranged for the ladies who attended the meeting.

Publicity Chairmen . . .

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Safety Engineer Speaks In New Jersey

Roy Lobosco, safety engineer with The Port of New York Authority, was the featured speaker at a recent dinner meeting of the Professional Engineers of Hudson County, New Jersey SPE chapter. Mr. Lobosco's topic was *Fire Protection on the Drafting Board*. The meeting was held at Bruno's Restaurant in Jersey City.

Another recent meeting of the chapter featured a program on air pollution control. Speakers for this event were: William G. Christy, consulting engineer and formerly director of smoke abatement control for New York City; William Munroe, principal sanitary engineer and coordinator of the air sanitation program, New Jersey Department of Health; and L. A. Brown, president of the Industrial Smoke Abatement Association of Hudson County.

Shoch Completes Two Speaking Tours

January and February were very full months for Clarence T. Shoch, president of the National Society, as he followed a busy itinerary through the West and Midwest.

President Shoch's January tour began with an address before the members of the Washington Society of Professional Engineers in Seattle on January 13. From Seattle, he proceeded to Boise where he addressed the members of the Idaho Society during their annual meeting on January 15. Speeches before the Golden Gate Chapter of the California SPE in San Francisco, the Fresno Chapter, and the Los Angeles and Pasadena Chapters followed. Then on January 20, President Shoch addressed a meeting of the Southern Chapter of the Arizona Society, and on January 21, he delivered one of the principal addresses before the annual meeting of the Texas SPE in Dallas.

The NSPE president's February tour was arranged coincidental with the National Engineers' Week observance. Chapters and societies hearing him give major addresses included the Minnesota SPE meeting in St. Paul in conjunction with the Minnesota Federation of Engineering Societies' convention, the Eastern Chapter meeting in Kansas City, Kan., and the Wichita Chapter of the Kansas Engineering Society, the Oklahoma SPE meeting in Oklahoma City, and the Tennessee SPE, meetings in Kingsport.

NYSSPE Winter Meeting Is Held In Rochester

The annual winter meeting of the New York State SPE was held February 4-5 at the Hotel Rochester, Rochester, N. Y. Among the speakers were Charles H. Sells, a consulting engineer of New York City, and Glen G. Davis, owner and manager of the Glenn Davis Company of Schenectady.

California Exam Book Is Published

A new enlarged and revised edition of August E. Waegemann's book, *California Civil Engineering Registration Examinations*, is now availabl. according to Mr. Waegemann, a well-known member of the California SPE.

Full information on the 287-page book is available from Mr. Waegemann, at 2833 Webster St., San Francisco 23, California.

Kansas Engineers Meet In Hutchinson

The first annual meeting since the merger of the Kansas Society of Professional Engineers with the Kansas Engineering Society was held late in January at the Baker Hotel in Hutchinson. The two-day convention featured both business and social sessions with a special program for the ladies who attended.

One of the main addresses during the meeting was made by Noah E. Hull, vice president and general manager of the Hughes Gun Company, Houston, Texas. Mr. Hull discussed the problems of developing a state fee and salary schedule.

Don Vickers served as general chairman for the meeting, for which members of the local chapter, of which Francis Rankin is president, acted as hosts.

Patent Lecture Is Given In New York

Norman N. Holland, president of the New York Patent Law Association, was the featured speaker at a recent joint meeting of the New York Chapter of the NYSSPE and the New York District of the American Society for Testing Materials. Mr. Holland, who studied engineering at Johns Hopkins University as well as graduating in law from Fordham, discussed *The New Patent Act As It Affects Engineers.*

Six Well-Known Speakers Heard On TSPE Program

Six prominent speakers were featured on the program of the Texas Society of Professional Engineers' annual meeting in Dallas, January 19-21. They were: Howard T. Tellepsen, president of the Texas Manufacturers Association and a prominent TSPE member; NSPE President Clarence T. Shoch; Rear Admiral John R. Perry, chief, Bureau of Yards and Docks, Civil Engineer Corps, U. S. Navy; NSPE President Robert J. Rhinehart; R. M. Dixon, managing director of the Municipal Contractors Association and president of the Dallas Chapter of the Texas Society; and Willis Tate, president of Southern Methodist University.

Another highlight of the meeting was the installation of J. S. Hudnall as Society president, J. B. Dannebaum as first vice president, and Gibbs A. Dyer as second vice president. Mr. Hudnall succeeded Frank T. Drought in the chief administrative office.

Engineering Is Their Concern

The photo above was made during a recent meeting in West Lynn, Mass., of the North Shore Chapter of the Massachusetts SPE. Left to right are: L. W. Burton, chapter president; M. M. Boring, engineering manpower consultant with the General Electric Company, who was guest speaker for the occasion; and P. Wilson, chapter public relations chairman. Mr. Boring discussed educational needs and problems.

Below, left to right, are: A. Picardi, program chairman, Toledo, Ohio, SPE; John W. Snyder, former U. S. Secretary of the Treasury and now executive vice president, Overland Corporation; and Charles Hatch, chapter president. Mr. Snyder was the guest speaker at a recent Toledo meeting at which he discussed engineering in relation to the national economy.

Delaware Members Get Civic Posts

Two active members in the Delaware SPE — John I. Cahalan and Roger W. Fulling — have recently been appointed to civic posts. Mr. Cahalan, a DSPE director, has been appointed to a six-year term as county engineer of New Castle County, while Mr. Fulling has been named by Governor Boggs to the Delaware State Board of Registration for Professional Engineers and Land Surveyors for a four-year term.

Full Time Office Opened By Michigan SPE

The Board of Directors of the Michigan Society of Professional Engineers has announced the opening of a full time state central office in the Bauch Building in Lansing. The office, which began operation on January 5th, is staffed with secretarial help to relieve the elected officers of detail work so that they may devote more time to strictly professional concerns.

... more news on page 35

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News From Savannah

Members of the Savannah Chapter of the Georgia SPE met recently to honor past presidents of the chapter and hear John Pidcock, president of the local Chamber of Commerce, discuss interests common to both members of professional engineering societies and his organization.

During the business session which preceded Mr. Pidcock's address, a resolution was introduced and passed paying tribute to the late George A. Belden, a leading member of the chapter, who died suddenly on January 9th. Mr. Belden was a member and past chairman of the State Registration Board, in addition to belonging to NSPE and other professional societies. At the time of his death he held the position of assistant chief engineer with the Central of Georgia Railroad.

Robbins Addresses Canadian Meeting

NSPE Executive Director Paul H. Robbins was the featured speaker at the annual luncheon of the Association of Professional Engineers of the Province of Ontario during the organization's recent annual meeting in Toronto.

Mr. Robbins' address, which was given wide coverage in the Canadian press, stressed many topics of professional interest, including the efforts of both the United States and Canada to maintain engineering superiority as a cornerstone of peace, an appraisal of engineering trends in the United States, the correlation of U. S. and Canadian efforts in providing technical assistance for other nations of the free world, and the need for constant vigilance by professional engineers to insure the maintenance of professional status.

. . . more news on page 37

CLEVELAND BANQUET—The photo at the right was made during the 19th annual banquet of the Cleveland Society of Professional Engineers. Left to right are: G. Brooks Earnest, past president of the CSPE and president of Fenn College; Ray H. Sullivan, vice president of the Ford Motor Company, the principal speaker of the evening; and Dr. Harry Osborne, director of research, Ohio Crankshaft Company, who was toastmaster for the evening.

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Joint Meeting For St. Louis Groups

The St. Louis Chapter of the Missouri SPE and the St. Louis District of the American Society for Testing Materials recently sponsored a joint meeting at which Norman L. Mochel was the guest speaker. Mr. Mochel is national president of the ASTM and manager of metallurgical engineering at the Westinghouse Electric Corporation's Lester Branch in Philadelphia. *Power and Material, Now and in the Future* was the subject of his lecture.

In addition, R. J. Painter, executive secretary of the ASTM, spoke on *Cooperation in Materials Research and Standards.*

PSPE Regional Meeting Held In Reading

More than 200 Pennsylvania members from 15 chapters gathered in Reading recently for a regional meeting. Among the guests who addressed brief remarks to the delegates were: Clarence T. Shoch, NSPE president; Robert F. Miller, PSPE president; Carl L. Kreidler, PSPE regional vice president, and John T. West, Jr., PSPE executive secretary.

John W. Landis, an engineer in the Atomic Power Division of the Babcock & Wilcox Company, was the featured speaker.

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Announcement No. 3-107-1 (55), Jan. 18, 1955

Executive Secretary
Board of U.S. Civil Service Examiners
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Grad. INDUSTRIAL ENGR. or its equivalent in engineering or INDUSTRIAL MANAGEMENT. Age 28-35. 3-5 yrs. exp. in industrial engr. where he has specialized in the fields of work standards, cost analysis, manufacturing controls, budgetary work, etc. A familiarity with accounting procedures and techniques desirable. Starting salary range from $5400 to $7,200.00. (109-S-12)

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An Engineering Problem ?
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Testimony

(Continued from page 27)

hancing the morale and service of the professionals. In fact, the Congress of the United States has accepted this basic doctrine from time to time and provided separate identification and treatment for professionals under appropriate circumstances. An instance of this is the Taft-Hartley Act, which defines professional employees and gives them the right of a separate determination election in appropriate representation proceedings, if any. The Army Organization Act of 1950 contains a provision prescribing that persons assigned to professional duties shall possess special qualifications similar to the professional qualifications required for similar work in civilian life. The Wage-Hour Law contains an exemption from certain provisions for professional employees. Other cases could be cited to illustrate the recognition by the Congress of separate identification and treatment of professional persons.

Prior to 1949 the Federal classification structure recognized the distinction discussed above and provided a separate pay schedule for those in the "P" (Professional) category as distinguished from the "CAF" (clerical-administrative-fiscal) employees.

The Classification Act of 1949 eliminated the distinction and established the present GS (General Schedule) category for both professional and other classifications. This was done on the theory that the change would simplify the administration of the law and would therefore lead to economy in personnel administration. It was stated at the time that editorial arrangement of classes of positions into occupational groups with appropriate standards established by the Civil Service Commission could be accomplished "without detracting from the recognition due established professions and sciences." (Senate Report No. 847, 81st Congress, 1st Session)

We respectfully submit that the experience since that time has demonstrated that "the recognition due established professions and sciences" has been diminished as a result of the elimination of the separate schedule for professionals. With the loss of separate identification has developed a natural tendency toward total group consideration, whether the individuals affected be of the professional category or in other occupational groupings. The effect has been a decline in morale among professionals, a feeling that the acquisition of specialized knowledge in a profession is no longer regarded as a material factor in personnel decisions, and a trend toward failing to give the professional personnel full opportunities previously accorded in such matters as selection of candidates for advanced training leading toward positions of higher responsibility in government administration. This situation is particularly unfortunate when applied to personnel progression in areas where specialized professional knowledge is desirable for higher administrative responsibility.

The Chairman of the Civil Service Commission in transmitting the report, "Study of the Shortage and Salaries of Scientists and Engineers," to the Senate Committee on Post Office and Civil Service, commented: "It is our opinion, however, that salary changes, if any, for this group (scientists and engineers) should only be considered as part of a general review of pay schedules under the Classification Act of 1949, as

(Continued on page 40)

STRICTLY BUSINESS

Personalities . . . G. D. Simonds has been elected vice president for engineering of the **Four Wheel Drive Auto Company,** Clintonville, Wisc., according to **Robert A. Olen,** president. . . .

Mr. Simonds

Brigadier General Joseph J. Twitty, former chief of staff of the Fifth Army, has joined **Palmer & Baker, Inc.,** consulting engineers of Mobile, Ala., to supervise construction of the $46 million causeway across Lake Pontchartrain near New Orleans. . . . **David Hendrickson,** formerly senior engineer of the East Bay Municipal District, Oakland, Calif., has joined the engineering staff of **The Hinchman Corporation,** engineers of Detroit, Mich., according to **J. F. Hirshfeld,** vice president. . . . **Ralph W. Heer,** works manager, has been elected vice president-manufacturing at **Pioneer Engineering Works, Inc.,** Minneapolis, Minn., according to **O. J. Ellerston,** president. . . . **C. Dana McCoy** has been named New York manager and international director of **The Rust Engineering Company,** Pittsburgh, Pa. firm. . . . **F. C. Gardner,** president of **Ebasco Services Incorporated** of New York has announced the appointments of **A. T. Larned** as consulting engineer, **C. C. Bonin** as chief civil engineer, and **A. C. Clogher** as an associate consulting engineer of the engineering, construction and business consulting firm.

John D. Russell, formerly manager of engineering, **Joy Manufacturing Company,** Pittsburgh, has been appointed vice president for engineering by the firm. . . . **Philip K. Davis** has been appointed a vice president of **The Austin Company,** Cleveland

Mr. Davis

enginering and construction firm which he represented as project manager for the design of the Atomic Energy Commission's Oak Ridge National Laboratory from 1945 to 1952. **Clayton L. Foster,** manager of the firm's Special Devices Division, headquartered in New York, has also been named a vice president, as has **John H. McVey,** southern California district manager. . . . **J. Dana Peet** has been appointed superintendent and **John F. Hotchkiss,** assistant superintendent, of the Sundries Manufacturing Division in **Kodak Park's** manufacturing services organization, according to **Ivar N. Hultman,** vice president of the **Eastman Kodak Company,** Rochester, N. Y. . . . Appointment of **James Adams, Jr.,** to the position of chief engineer, research and product design, has been announced by the Manhattan Rubber Division of **Raybestos-Manhattan, Inc.** of New York. . . . **George E. Blatchley** has been named chief engineer of the Marketing Department of **The American Oil Company,** New York, according to **Thomas A. Aldridge,** vice president in charge of marketing. . . . **H. E. Bailey,** formerly general manager, **Oklahoma Turnpike Authority,** has joined the Chicago engineering firm, **De Leuw, Cather & Company,** as southwestern manager in the Oklahoma City office.

Leonard V. James, well-known illuminating engineer, has been retained by **Solar Light Manufacturing Company** of Chicago and Los Angeles as a technical consultant. . . . **Albert J. Reed** has been elected director of research of the **National Clay Pipe Research Corporation,** Cleveland. . . . **Thomas W. Johnson** has been appointed director of engineering of the **New York Air Brake Company,** according to Charles T. Zaoral, president. . . . **Robert R. Cutler, C. J. Haglund, Thomas H. Mitchell,** and **Ralph W. Olmstead** have been named vice presidents of **The H. K. Ferguson Company,** engineers and builders of Cleveland, O. . . . **Theodore O. Rudd** has succeeded **C. R. R. Harris** as president of the **Kerite Company** of New York, N. Y. and Seymour, Conn. Mr. Harris has become chairman of the board and chief executive officer of the firm. . . . **George M. Butters** has been appointed works manager of the newly organized Construction Equipment Division of **Blaw-Knox Company,** Pittsburgh. . . . **Franklin C. MacKressl,** a vice president of **Stone & Webster Engineering Corporation** has been named district manager in charge of the Chicago office.

New Firms . . . The formation of the firm of **Anton J. Eichmuller, Consulting Engineers,** at 446 Hipp Building Annex, Cleveland, O., has been announced by **Anton J. Eichmuller,** the senior associate. The practice of the firm, which succeeds the organization of **A. Paul Konter, Consulting Engineers,** of the same address, will be limited to electrical engineering. . . . The formation of **Prestressing Research & Development, Inc.,** with offices in the Transit Tower, San Antonio, Tex., has been announced by **James J. Mennis,** president. The object of the new firm is to provide consulting services for specialized applications of prestressing, as well as studies and recommendations for manufacturers concerning the application of pretensioning and post-tensioning methods to their operations. **F. E. Koebel** is vice president of the new firm. Other associates are **T. J. Gut,** who is also vice president of **Texas Stressed Concrete Corporation,** and **E. C. Molke,** formerly chief engineer of **Preload Engineers** of Arlington, Va. . . . **Harry E. Day,** president, has announced the formation of the **Delta Welder Corporation** in Detroit to engage in the design, engineering, and building of automatic multiple point welding machines, other special and standard resistance welding machinery, and automation equipment. **Glenn Cashdollar** is vice president of the new firm, while **Arthur Zebedee** is secretary-treasurer. **James Carswell** has been named chief engineer; **Richard Clifton,** chief sales engineer; and **Gerald Van Loo,** purchasing agent.

Ownership Changes . . . George A. Rentschler, chairman of the board of the **Baldwin-Lima-Hamilton Corporation** of New York, has announced that his company has acquired ownership of the **Erwin Loewy Hydropress** interests.

Testimony

(*Continued from page 38*)

amended. Only in this manner is it possible to maintain the basic principle of the Classification Act, which is that equal pay shall be given for substantially equal work."

We think that this comment illustrates a basic weakness in the idea of including specialized professional personnel with others. It is undoubtedly true that equal pay should be given for substantially equal work, but the present system dictates equality of work as between professionals and administrative personnel, when in fact, the basis of comparison is totally different.

Private industry has generally recognized that no such comparisons can properly be made and has established separate schedules and classifications systems for professional employees.

We urge that the Committee give early consideration to amending the Classification Act by providing a "P" (Professional) classification and pay system in the earnest belief that such action will be a major step toward helping the government achieve its objective of attracting and holding fully qualified and competent engineers and scientists.

Professional Qualification

Efficiency and economy in government operations cannot be achieved unless the personnel of the government agencies are fully qualified for their positions by reason of education, training and experience. This is particularly true in the case of specialized personnel, such as engineers, lawyers, doctors, architects, accountants and others. This is fundamental in the case of engineers because of their responsibility for the design, direction and/or administration of large and important projects, involving many billions of dollars each year.

The selection of engineering personnel, in both design and administrative functions, has heretofore, and at present been accomplished on the basis of general qualification and examination, when appropriate, by the Civil Service Commission and individual governmental agencies. This process, while it has brought many capable and qualified engineers into responsible Federal positions, has not assured fully qualified professional engineers in all responsible engineering positions. Often, persons are moved into "engineering" positions of responsibility based on past administrative service which has not required an engineering background.

From time to time, government personnel are required to testify in judicial or other preceedings as expert witnesses. In the case of engineering testimony, the witness is vulnerable to attack on qualification if it is shown that he is not qualified as a professional engineer as established by law in all the states. Such instances are embarrassing to the government and may prejudice the government's case.

It may be appropriate in connection with this point to cite the case of *B. M. Aycrigg and Helen F. Aycrigg, et al.* v. *United States of America*, decided on April 24, 1952, by the United States District Court for the Northern District of California, Northern Division, Case Nos. 6299, 6309, 6314. The litigation involved a levee break on certain work performed by the U. S. Army Corps of Engineers. In evaluating responsibility for the break and consequent damage, Judge Dal M. Lemmon pointed out that the Corps of Engineers failed to have a registered engineer in charge of the work of heightening and strengthening the levee, commenting: ". . . When the safety of human lives and of millions of dollars worth of property is involved, it seems penny-wise and pound-foolish to cut corners in levee construction." In his conclusion, the Judge cited two findings of negligence in principal respects, the first finding being: "Entrusting the supervision of so important a task to two 'inspectors' who were not registered engineers."

This Society believes that where a professional field is clearly delineated by law, the Federal Government should accept and follow the line of demarcation between those who are legally qualified to practice the profession and those who are not so qualified. This principle is accepted in the case of the medical and legal professions, but not in engineering. With the extensive amount of Federal monies to be expended under the direction of engineering supervision and responsibility, the Federal Government has the duty to the taxpayer of assuring him of the competency of the engineering personnel involved. The state engineering registration laws, have been adopted in order to safeguard life, health, and property and promote the public welfare. This principle has induced the state legislatures and the Congress of the United States, in the case of the District of Columbia, to recognize as a matter of public interest and concern "that the profession of engineering merit and receive the confidence of the public and that only qualified persons be permitted to engage in the practice of engineering" (quoted portion from Public Law 789, 81st Congress, 2nd Session). It would seem imperative that the Executive Branch of the Federal Government likewise recognize these principles for those in responsible engineering positions.

There may have been some reason for the failure to recognize engineering registration in past years when not all of the states and other areas of the nation had engineering registration laws. That is not true today, and there is no longer this reason to retain an outmoded policy as regards the engineering profession.

In view of the long history behind this situation, it may not be practical to impose an across-the-board requirement of registration under a state law to qualify for an engineering position with the Federal service. However, a start should be made in that direction and it is suggested that the first step should be the institution of a registration requirement for new employees or promoted employees to engineering positions at the level of Federal classifications which first involve engineering duties considered to be of a responsible supervisory or administrative nature.

We suggest that this point is the present grade GS-13, which is the first grade in the Federal schedule requiring at least four years of broad and progressive professional engineering experience. The state engineering registration laws also require four years of similar responsible experience to qualify for licensure as a professional engineer. By establishing the registration requirement at a relatively high level initially a proper beginning can be made which will permit ample opportunity for engineers in the lower grades to acquire the necessary experience and qualify for registration before they reach the level at which the registration requirement is applied. We should like to emphasize that under this proposal no incumbent in grade GS-13 or higher would be adversely affected as the provision would be operative only in the future.

It is respectfully suggested that the Committee give early consideration to a further amendment to the Classification Act which will incorporate the registration requirement for professional engineers.

Conclusion

The National Society of Professional Engineers sincerely believes that the adoption and implementation of the three basic recommendations made herein will considerably enhance the position of Federal Government agencies in achieving a professional engineering force which will be not only adequate in numbers, but outstanding in efficiency of planning and operation. In that spirit we summarize our three points of recommendation that:

1. Appropriate pay increases as now contemplated are justified and necessary.
2. That the Classification Act be amended to establish a "P" (Professional) schedule.
3. That the Classification Act be amended to require registration under state law in the case of professional engineers who may be appointed or promoted to positions in present grade GS-13 or above.

The National Society of Professional Engineers offers the Committee and its staff any and all cooperation or assistance which may be desired in the study of these recommendations.—***End.***

New Salary Survey Is Under Way

The National Society of Professional Engineers is now compiling data obtained from a just-completed survey of the 1954 incomes of its members.

Questionnaires were mailed to the members on January 15, with February 15 set as the cut-off date for their return. More than 14,000 replies were received by this deadline, and the work of analyzing the returned questionnaires, and preparing appropriate graphs and charts for publication in the final report is now in process at national headquarters in Washington.

The analysis of the income reports will be handled in much the same manner as the 1952 NSPE Income and Salary Survey, which was so well received by government, industry, and professional groups. It is also expected that the final report will include some pertinent comparisons between the new 1954 income statistics and the 1952 figures.

Publication of the complete report has been tentatively set for June, and it is anticipated that preliminary coverage will be given in the AMERICAN ENGINEER as the initial findings become available.—***End.***

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RAMMING MIX—Basic Refractories, Inc., producer of granular basic refractories, announces a new, illustrated booklet entitled, "Ramset—New and Unusual Applications" discussing in limited detail new uses of this unique magnesia ramming mix, designed for original bottom construction and maintenance of open hearth and electric steel producing furnaces. Among the lesser known applications discussed are its uses for: rammed runners; short spouts and aprons; furnace construction; mold stools; and setting ladle nozzles. From Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.

—AE—

DOORS FOR INDUSTRY AND AVIATION—International Steel Co. has just published its 1955 Catalog of Doors For Industry and Aviation. Provides up to date facts, figures and planning data on new developments in doors for hangars, warehouses, piers and other buildings. Hangar doors feature: telescoping canopy, turnover canopy, low headroom braced canopy, bifold canopy, straight slide, and around slide doors. Industrials include vertical lift, turnover, crane doors and vertical lift pier doors. Each is described by charts, specifications and operational data. Copies from: Marketing Services Division, International Steel Company, Evansville, Indiana.

—AE—

HIGH SPEED INDEX TABLES—New 12 page catalog describes the Ferguson "Intermittor," standard precision index tables for high speed production, Catalog No. 300 contains assembly drawings, tables of load ratings and dimensions of over 150 models and data on the indexing mechanism, a Ferguson Roller Gear Drive. Standard index tables are available with from 4 to 36 work stations; dial sizes range from 12" to 48". For your copy write to: Ferguson Machine & Tool Co., Roller Gear Div., P. O. Box 191, St. Louis 21, Mo.

GRATING, STAIR TREADS—Bulletin #1105, just published by Dravo Corp., describes the complete line of Tri-Lok Interlocked and Tri-Forges Welded grating and stair treads. The 16-page booklet explains construction features of the two types. Photographs and detail sketches fully illustrate the many styles available as well as typical installations and applications. A series of tables list the grating weights, standard sizes of safety stair treads, panel widths, and the safe bearing loads for various bearing-bar spacings. Diagrams explain typical fastening devices. Write: Dravo Corp., 1203 Dravo Bldg., Pittsburgh 22, Pa.

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ROOF DRAINS—A complete, informative reference prepared to aid in the specification and installation of roof drains is being released by J. A. Zurn Mfg. Co. Of special interest are drawings showing type of drain to use and how to install drains in standard types of roof construction. Roof drain outlet and sizing data are included. Several feature pages are devoted to special problems, such as snow and ice removal, cloudburst drainage, and roof expansion and contraction protection. Drains and recommended drain arrangements for Open Deck Parking Areas and Outdoor Recreation Terraces are also shown. For your copy of Zurn Roof Drain Manual No. 54-1, write on your letterhead to J. A. Zurn Mfg. Co., Plumbing Division, Erie, Pa.

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ELECTRIFIED REINFORCED CONCRETE—A new 16-page booklet, "Electrical Outlets Wherever You Need Them," has just been published by Concrete Reinforcing Steel Institute. It gives complete details on R/C Duct Floors, said to provide 100% electrical flexibility for buildings at low cost. They consist of standard reinforced concrete joist floors, with a network of electrical distribution ducts buried in the structural slab. No special concrete "fill" is needed. Contains structural details, design considerations, and cost comparisons. Fire rating tests conducted at Underwriters' Laboratories, Inc., are included. Write to: Concrete Reinforcing Steel Institute, 38 South Dearborn Street, Chicago 3, Ill.

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—AE—

DIGITAL CONVERTERS—A complete line of Digi-Coder digital converters, electro-mechanical shaft position types and voltage types, are described in Fischer & Porter Catalog 58-10. The first type mechanically converts shaft position into discreet electrical contact combinations for a digital code. The second type converts voltages to digits for spans of 0 to 1 millivolt and up. Various models of both types are described for dynamic readout, linear or non-linear conversion, and direct reading ranges. Operation, characteristics, accuracy, and specifications of the Digi-Coders are described and illustrated with photos, drawings and installation diagrams. Catalog 58-10 may be obtained from Fischer & Porter Company, 302 Jacksonville Road, Hatboro, Pa.

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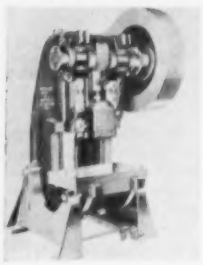

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CHARTS FACILITATE CALCULATIONS — *Item 2*

Two new mathematical charts developed by E. J. George, Sun Oil Company engineer, provide a convenient, economical tool that can be used more quickly than a slide rule or calculating machine. Charts consist of a log scale superimposed diagonally upon a log-log grid. The Multiphase Mathematical Chart includes scales for multiplication and division as well as those for obtaining directly the square root, cube root, and logarithm of a number. The Multiplication And Division Chart has the same pattern, but without the log, square and cube root curves. Both contain examples of operations which can be performed. Comparative runs show chart calculations fifty percent faster than a slide rule.

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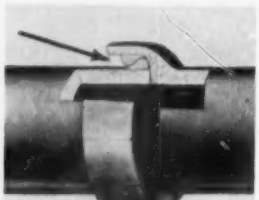
WEDGE-LOCK CLAY PIPE — *Item 3*



Development of Wedge-Lock clay pipe, revolutionary new root-proof, infiltration-proof vitrified clay pipe with a self-sealing, double-ball mechanical joint, has been announced by member manufacturers of Clay Sewer Pipe Association. Developed exclusively for vitrified clay pipe. Designed for installation in plastered walls, under basement floors, in high-water table areas and wherever root-proof joints are desired. Available soon in 4-, 6-, and 8-inch diameters, both standard and extra-strength.

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BONDS NEW FLOORS TO OLD — *Item 4*

A new brush applied plastic called INLAYCRETE BOND, that permanently bonds concrete to concrete, concrete to iron, steel, brick, stone, glass, or any firm surface, has been announced by The Garland Co. Eliminates laborious roughing of old floors with hammer or chisel. Brush it on, surface is ready for retopping in 30 minutes. Concrete, cold mastic or magnesite can be applied right over the Bond. Used for laying new floor topping to old floor, patching holes in concrete, resurfacing worn steps, driveways or curbing and building restoration.

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BRICK AND BLOCK HEATER — *Item 5*

Building and masonry work can now continue at colder temperatures than usual after bricking materials pass through new Eclipse Brick and Block Heater. Ice and snow coated materials may be used immediately after going through heater and joint striking may be done almost the same as during summer operations. Temperature of materials can be controlled by adjustment of heating torches and speed of flow through heater.

This column describes new products of general interest to professional engineers. For further information, fill in the coupon provided and mail to the AMERICAN ENGINEER.

WILD POCKET THEODOLITE — *Item 6*

Due to a new optical design of the telescope the new Wild T-12 Pocket Theodolite is unusually compact and its total weight, including metal carrying container and tripod is 7 pounds. The T-12 is specially suited for preliminary surveys, reconnaissance work, construction and location surveys. A well-illustrated booklet describes in detail the outstanding features of the T-12.

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IMPROVED TAPE — *Item 7*

An improved electrical insulation tape "for use in 90% of the holding and insulating jobs in manufacturing and repairing electric motors, coils, transformers, and generators" has been announced by Minnesota Mining and Manufacturing Co. Designated "Scotch" brand electrical tape No. 39, the improved thermosetting paper tape features a pressure-sensitive adhesive that sticks tight on contact with 50% more "grab" than its predecessor, sacrifices none of its true thermosetting features, according to the manufacturer. Its adhesive forms a permanent, solvent-resistant bond after curing. Important feature is thinner construction, only five mils thick, making it more useful where space is at a premium.

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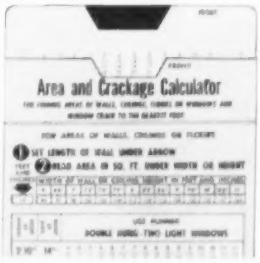
AREA AND CRACKAGE CALCULATOR — *Item 8*

Newly perfected is a direct reading calculator which can be used to obtain areas of floors, ceilings, walls, etc., instantly and accurately. Areas of windows that should be treated as glass—either by opening size or glass size—are also readily obtainable, along with the lineal feet of crack. The Morton Area and Crackage Calculator conforms to the National Warm Air (Crackage) Method of figuring. Operates like a slide rule, yet reads direct like a table—no interpolating required. Of vinyl plastic, 3¾" x 9". Three scales along back edges provide added usefulness.



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SOIL TESTER PROVIDES MORE CONTROL — *Item 9*

Consolidation tests on soil samples can be conducted with greater ease, control and accuracy with the new Conbel physical soil testing machine announced by the Tinius Olsen Testing Machine Co. Designed by Karol and Warner, the Conbel can be used in conjunction with any one of four standard consolidometers to give vital data for evaluating amount and rate of settlement of soil under load. Heart of this table mounted testing machine, only 12" x 18", is the hydraulic loading system incorporating an efficient metallic bellows, which completely eliminates the use of cumbersome dead weights for load application. All controls are at the operator's fingertips.

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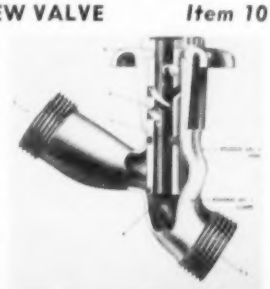
COMPLETE SEAL FEATURE OF NEW VALVE — *Item 10*

One of the unusual features employed in the HEMCO Valve is that a *complete* seal is brought about by an O-ring (C) and Sock (B). These are the only wear points and have low replacement cost. Design permits many ramifications and adaptations for faucets, as dump valves, drain valves, angle valves, tank car valves, etc. May be operated by solenoid, air, vacuum, hydraulic and other remote controls.



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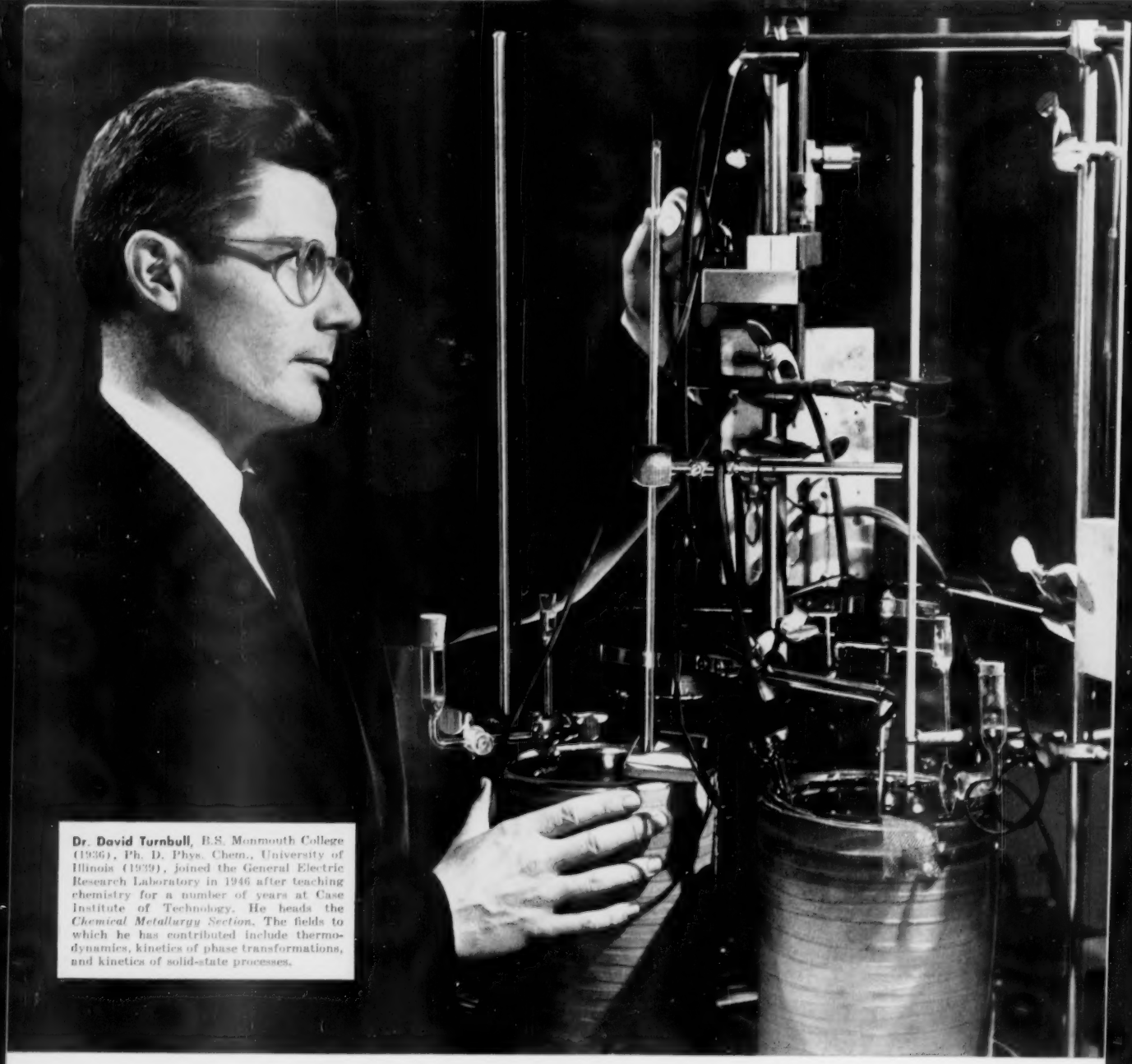

Dr. David Turnbull, B.S. Monmouth College (1936), Ph. D. Phys. Chem., University of Illinois (1939), joined the General Electric Research Laboratory in 1946 after teaching chemistry for a number of years at Case Institute of Technology. He heads the *Chemical Metallurgy Section*. The fields to which he has contributed include thermodynamics, kinetics of phase transformations, and kinetics of solid-state processes.

How atoms behave in alloys

Dr. David Turnbull of the General Electric Research Laboratory demonstrates importance of crystal defects in structure changes

New understanding of the mechanisms responsible for the formation of alloy structures has been achieved by Dr. David Turnbull and his colleagues in General Electric's *Chemical Metallurgy Section*.

They discovered that crystal imperfections and foreign particles play a decisive role in controlling structure development. For example, precipitation in age-hardening alloys often takes place millions of times faster than can be explained by known rates of diffusion in single crystals. Dr. Turnbull showed that this rapid precipitation is due to the "short circuiting" of diffusion by certain crystal defects.

Because microstructure determines some of the most important qualities of alloys, including strength and certain magnetic properties, this new knowledge will be valuable in the development of stronger, more versatile materials for tomorrow's technology.

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